VOL. 80 No. 2047
OCTOBER 4 1958

Telephone: FLEet Street 3212 (26 lines)
Telegrams: Allangas - Fleet - London

Editor M. C. HYDE
Manager H. A. WILLMOTT
Director N. B. LIVINGSTONE WALLACE

Midland Office
Daimler House, Paradise Street, Birmingham. [Midland 0784-5]

Leeds Office
Permanent House, The Headrow, Leeds 1. [Leeds 22601]

Scottish Office
116 Hope Street, Glasgow C2. [Central 3954-5]

IN THIS ISSUE

Chlorine Recovery Process	554
SO_2 in Flue Gases	555
Distillates	556
Finland's Chemical Industry	557
Sea-water Magnesia Plant Extended	558
Centenary of Diazo Reaction	560
Pay Rise for Fine Chemical Workers	560
Equipment Review	561
Uses for Glycerine Derivatives	563
Circular Calculators for Pipe Flow	563
Overseas News	565
W. German Chemical Imports Up	566
People in the News	567
Trade Notes	568
Diary Dates	568
Commercial News	569
Market Reports	570
New Patents	571

Annual subscription is: home, 52s 6d, overseas, 60s, single copies 1s 6d (by post 1s 9d)

CHEMICAL AGE

BOUVERIE HOUSE · 154 FLEET STREET · LONDON · EC4

US FIBRE VENTURE

MANUFACTURE of polyester fibre that is chemically the same as Terylene is to be undertaken by a joint company formed by Imperial Chemical Industries Ltd., whose Fibres Division developed the fibre, and Celanese Corporation of America. Announcing this, ICI say that the fibre will be marketed by Celanese Corporation on behalf of the new company under the trade name 'Teron.' This US venture of ICI will join the company's considerable technical knowledge in the field of polyester fibre production with the selling facilities of the Celanese organisation—a pioneer and leader in the production and marketing of man-made fibres in the US.

Location of the plant to manufacture the fibre has not yet been decided. The plant is expected, however, to have an eventual capacity of 40 million lb. a year and will manufacture both continuous filament yarn and staple fibre. No indication of the cost of this project has been given, but a rough estimate would probably be something of the order of $200 million.

In this country, ICI's present plant capacity is 22 million lb. a year, which is being expanded to 30 million lb. by the middle of next year. Recent ICI plans announced will bring this capacity up to 50 million lb. a year. In Canada, ICI's subsidiary, Canadian Industries Ltd., makes Terylene in a plant with an annual capacity of 11 million lb. Sublicences have been granted by ICI for the manufacture of polyester fibre in France, Holland, Western Germany, Italy and Japan. In all these countries a different trade name is used. In France the fibre is marketed as Tergal, in Holland as Terlenka, in Italy as Teretal, in Germany (by two companies) as Dialen and Trevira, and in Japan as Tetoron. Both the Japanese companies are using the same trade name.

The decision by ICI and Celanese Corporation to combine forces for producing and marketing polyester fibre in the US is the culmination of several months of discussion. No doubt an important talking point has been the fact that in 1961 the basic patents sold by Calico Printers Association Ltd., in whose laboratories the polyester was discovered, to E.I. Du Pont de Nemours and Co., will expire and cannot be extended. As will be recalled CPA reached an agreement with ICI in 1947 whereby the latter were given rights for the devlopment, manufacture and marketing of the fibre throughout the world except in the US. Polyester fibre is therefore at present only manufactured in the US by Du Pont, who market the product under the trade name of Dacron. Annual production of Dacron is estimated at 50 million lb.

Regular exchanges of technical and marketing information and collaboration will continue, and the new company will be the beneficiary of polyester fibre research and development findings by both ICI and Celanese Corporation as well as rights to patents of both parent firms in the polyester fibre field.

A decision as to the extension of CPA's Terylene patents in the UK is still awaited. The two patents involved expired at the end of June, but an extension was applied for last February. In April, British Celanese lodged an opposition to this extension. Therefore, although the patents

have expired, they continue in force until the application for extension is settled. (British Celanese have no connection with the Celanese Corporation of America.)

The new company will not be able to sell Teron in the US until 1961, when the Du Pont patent expires. In any event a site for the plant has to be chosen and construction and commissioning are likely to take up most of the waiting period.

In the meantime other types of polyester fibre are in the experimental stage in the US. Companies involved are Beaunit Mills Inc., Tennessee Eastman Co., and Chemstrand Corporation. Eastman in fact are so far advanced that they expect to be marketing their Kodel polyester fibre next spring. Beaunit Mills have plans for a 10 million lb. polyester fibre plant to go on stream next year at Elizabethton, Tennessee.

Eastman's production plans are not known at present. Output of Kodel has been limited to pilot plant quantities for evaluation. But additional facilities are reported as having been installed at Kingsport, Tennessee, to supply limited commercial quantities. No details have been released of the chemistry of this polyester fibre either. Claims made for the fibre are that it is fundamentally different from any other polyester, both in chemical composition and internal molecular structure.

Properties of Kodel are listed as: moderately high tensile strength and modulus of elasticity; high resilience and toughness; good resistance to chemicals and heat (it is claimed that it can be ironed safely at temperatures as high as 425°F.); and, 'outstanding' resistance to pulling. These properties, Eastman say, combine to provide fabrics that are crease and wrinkle resistant, while the fibre's dimensional stability and low specific gravity mean that it can be used for lightweight wash and wear garments. The fibre can also be readily dyed, either by itself or in mixtures, in a broad range of bright fast colours.

Eastman's plan that Kodel should be introduced only in fabric blends containing at least 50 per cent of the fibre, but the company believes that it may find some applications in 100 per cent fabrics. Industrial applications are also foreseen.

Du Pont's Dacron, like ICI's Terylene, is increasingly finding use in industrial applications, such as conveyor and V-belts, and load-carrying filler cord in hose. It is also being used to make high strength paper and in nonwoven bats and felts. The US Navy is testing an airship fabric made of impregnated Dacron. The new material is reported as losing only one half as much helium as conventional airship envelopes. Under contract research to the US Air Force, a programme is being conducted to modify Dacron for use in deceleration parachutes, where nylon, because of its heat degradation, is impractical. A machine has even been developed, which in proper sequence hot stretches and heat relaxes Dacron yarns at about 400°F. The yarn thus processed retains its high tenacity at 6.7 to 7.0 grammes per denier, normal elongation of 14 to 16 per cent and a shrinkage of less than 2 per cent at 350°F. Evaluation tests of parachute components made from yarns so processed are stated to be under way.

That then is the present picture in the US. In 1961, Dacron will undoubtedly be firmly established in more industrial uses and it can be presumed that Du Pont will have gained Government contracts for use of Dacron in the armed services. At the same time new polyester fibres will have been introduced by other companies, and will be on the way to becoming firmly established if they have not already become so during the period 1960-61.

ICI's decision to combine forces with Celanese Corporation in order to compete with the powerful Du Pont organisation is definitely a bold one, and the results will be watched with considerable interest.

It was stated on Wednesday that the new joint ICI-Celanese Corporation of America company would be known as Lindum Fibres Corporation. For board of directors see 'People in the News', page 567.

HYDROGEN CHLORIDE

AFTER four months' trials on a large scale unit at Hooker Chemical's Montague Michigan, US, caustic-chlorine plant, news has been released by the company of a new economic continuous two-stage solvent extraction process for recovery of hydrogen chloride and chlorine. Impurities in by-product anhydrous hydrogen chloride are absorbed by means of solvent extraction, instead of as formerly, by absorbing the product in water. The company quote the production of an anhydrous product containing only 250 p.p.m. organic impurity.

Compared with the hydrochloric acid absorption—desorption process, the new Hooker process is stated to halve initial outlay as nearly all-iron construction is used; operating and maintenance costs are halved; the process operates effectively at as low as one quarter capacity and no-scale up limitations are envisaged; and, there is almost complete recovery of chlorine.

The new Hooker technique is described as a two-stage scrubbing operation. The feed gas which contains by-product hydrogen chloride and contaminants (unreacted chlorine and organics) enters a chlorine absorber, where carbon tetrachloride at about 35°C removes chlorine and organic vapours. The hydrogen dichloride fraction passes to a second scrubbing tower (zone 2) where hexachlorobutadiene (C-46) removes the carbon tetrachloride. Impurities remaining in the anhydrous hydrogen chloride are stated to be inerts and trace amounts of C-46. Carbon tetrachloride is used as the solvent in the first zone because of its low boiling point (76.8°C), price and excellent solubility for chlorine. Hexachlorobutadiene has been chosen for the second zone because of its high boiling point (215°C), low price, stability, inertness and its ability to absorb carbon tetrachloride.

Carbon tetrachloride from zone 1 scrubber (54 in. across and 54 feet high) passes to the chlorine stripper—also a carbon tetrachloride purification column (this stripper column is 66 in. in diameter and 42 feet high.) Overhead product from the stripper containing the recovered chlorine, then enters a scrubbing tower to reduce the carbon tetrachloride content. Hydrogen chloride-carbon tetrachloride mixture from zone 1 enters the carbon tetrachloride absorber (zone 2) at about 35°C, where it is scrubbed with C-46. Purified hydrogen chloride passes out overhead and the mixed solvent effluent enters a carbon tetrachloride stripper. Free C-46 is cooled and recycled to zone 2 scrubber. The carbon tetrachloride goes back to zone 1 chlorine stripper.

Circulation rate for zone 1 solvent or a single-solvent system is reported to be about 10 times that for zone 2 solvent. The two-solvent system has been found to save more than enough in utilities alone to pay for the additional equipment. The additional scrubbing ensures against the final product being contaminated by chlorine.

While this recovery process can be applied to almost any direct organic chlorination (particularly hydrocarbons), Hooker say that restrictions to its use are that the feed gas must be dry. So by-products from alcohol chlorinations cannot be recovered unless water is removed beforehand.

PERMITTED CONCENTRATION OF SO_2 IN FLUE GASES DISCUSSED AT CLEAN AIR CONFERENCE

CONTROL of heights of chimneys was considered by Norman Bastable, Chief Public Health Inspector, Barking, in a paper to be delivered at the Llandudno Conference of the National Society for Clean Air from 1 to 3 October. Upper limits had to be fixed, particularly in the case of sulphur didoxide concentrations.

No official guidance had yet been given as to what the maximum allowable concentration of sulphur dioxide should be. Mr. Bastable referred to the Department of Scientific and Industrial Research booklet 'Sulphur dioxide' which records the maximum allowable concentration of SO_2 for several hours' exposure as 0.3 mg./litre or 30 mg./m³. A US source is noted as suggesting that the maximum allowance concentration for 24-hour periods should be as low as 1/10th of the concentrations acceptable for an eight-hour exposure.

In Leeds, stated Mr. Bastable, a standard had been fixed at 0.4 p.p.m. (for SO_2 1/mg./m³ = 0.35 p.p.m.) of SO_2 as a maximum allowable concentration. O. A. Sutton's formula (*Quart. J. R. Met. Soc.*, 1947, **73**, 42C) was used for estimating the maximum ground level concentration which would arise from a source of emission. For the purpose of the Sutton formula an average wind speed of 9 ft. per second (5 m.p.h.) had been accepted. This calculation has been reported as giving reasonable chimney heights.

Atmospheric Sulphur

Measurement of atmospheric sulphur, mainly as sulphur dioxide, was considered by T. S. Pindard and Dr. E. T. Wilkins (Department of Scientific and Industrial Research, Fuel Research Station) at the Llandudno conference of the NSCA. Sulphur was measured empirically by exposing a standard lead-peroxide surface to the atmosphere for a month and then determining analytically the amount of sulphur absorbed.

Sulphur dioxide was also measured daily by the 'volumetric' method in which a measured volume of air was drawn through hydrogen peroxide solution and the amount of acid thus collected was determined by titration with alkali. The results of this method were generally expressed as parts of sulphur dioxide by volume per 100 million parts of air (p.p.h.m.).

Correlation between the two methods was only approximate because, although sulphur dioxide was the major pollutant determining the result in each case, the lead peroxide method was also affected by some other sulphur compounds and the volumetric method included other acids as the equivalent of sulphur dioxide.

The sulphur problem was also considered by Mr. R. Lessing, the president of the National Society for Clean Air, in his presidential address to the conference. This problem set the researcher some intricate questions, stated Mr. Lessing. The weight of sulphur dioxide discharged into the atmosphere was more than twice that of smoke, grit and dust combined.

Although sulphur compounds in the air were in quantity and virulence more damaging to health and property than any other pollutants, they were not dealt with in the Clean Air Act by reason of the lack of adequate knowledge of their causation and behaviour and the slow development of generally applicable methods of dealing with them.

An obvious method of reducing the quantity of this pollutant was the elimination of at least part of the sulphur from the fuel before it was burned. In the case of coal this required development and application rather than novel methods. Investigations on desulphurisation of fuel oil were believed to be on the research programme of some oil companies. The need for a satisfactory solution was great in view of the high sulphur content of refinery residues.

Mr. Lessing called for a closer study of the economics of sulphur removal from both coal and oil so as to ascertain a fair balance between additional cost and benefits gained. An objective of the highest importance was the elucidation of the mechanism of oxidation of SO_2 to SO_3 which latter on combining with water formed sulphuric acid.

A small proportion of the sulphur in chimney gases was always in the form of SO_3, particularly where the combustion temperature was high. Work on the neutralisation of this SO_3 was already proceeding, mainly for the purpose of protecting the inner surfaces of the flues and chimneys from corrosion by acid attack.

An impression had been gaining ground that SO_2 only became troublesome in the presence of smoke or other solid particles. The plausible explanation was that it was adsorbed on the surfaces in high concentration and converted to sulphuric acid. There was as yet not enough reliable proof of this theory, nor knowledge how SO_2 reacted with solids of different chemical composition, acidic, alkaline or neutral, such as were found in a flue dust mixture.

These investigations were in the domain of physical chemistry and their clarification would be of great help in work on the elimination of sulphur oxides from flue gases, and of equal importance in the biochemical study of the action of sulphur acids on the human and animal body.

Flue gas washing was a much debated subject and certainly needed close and impartial examination. Mr. Lessing suggested that many of the objections to it were based on *ex parte* statements unsupported by adequate scientific or economic evidence. There was much scope here for an independent, impartial inquiry.

Surveys of the distribution of sulphur dioxide in built-up areas could be usefully extended. It had been found, for example, that the rise and fall of sulphur in the air at St. Paul's Cathedral followed closely the sulphur emission from the old power station at Bankside, while that from the new station where flue gas washing was in operation did not show such correlation and was relatively small, although the fuel consumption of the new station was a multiple of that of the old.

ICI Division Chairman Notes Fall in Paraxylene and Ethylene Sales

THE third cracker at the olefine works of ICI's Heavy Organic Chemicals Division is due to be completed early next year. The research department has already done much work to see that the fullest possible use is made of products from the crackers.

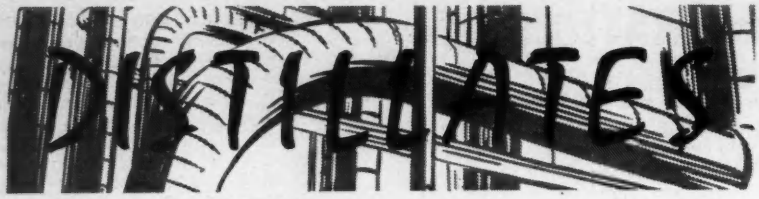
This was stated recently by Dr. S. W. Saunders, division chairman, when speaking at a meeting in Billingham with members of the oil works and olefine works councils. Dr. Saunders said it was hoped that a dispute between labour employed by constructors of the third cracker would not result in a serious delay.

The new unit incorporated a number of novel features, including the use of free-piston engines for driving much of the equipment. Their use in that type of plant was new and it was hoped that the cost would be reduced. A free-piston engine set was under test at Billingham and although it had not been trouble-free it was thought that the difficulties would be overcome before the start-up of the new Wilton cracker.

Dr. Saunders said that new sections were being set up which would not be concerned with running the plants, but with seeing how they could make products which were cheaper and of better quality. This was necessary because sales of some products had fallen as a result of reduced home demand and severe competition in overseas markets.

Stressing that there was no need for alarm, he felt there would probably be an improvement in the home market by early 1959. A great deal was being done to find new markets and new products. Demands from the company's Plastics Division had been somewhat lower with the result that less paraxylene and less ethylene had been required recently.

Dr. Saunders concluded by stating that the olefine works had recently completed one million hours' worked without a lost-time accident.



★ POLYPROPYLENE is still in the news. This journal (13 September, p. 436) reported further US companies announcing plans to produce the polymer. It was noted that in Europe there were Montecatini, the original producer of polypropylene, and Farbwerke Hoechst. At the silver jubilee conference of the British Plastics Federation held at Torquay last week, it was intimated that polypropylene was under development in this country.

The two most likely producers are ICI and Shell since both these concerns have propylene gas supplies. ICI, for instance, have three olefine plants at Wilton which produce some propylene. Output of propylene could easily be stepped up if required. Also, ICI's Plastics Division are definitely 'having a look at polypropylene'. Shell Chemicals could very well produce polypropylene in the UK and are also in a position to make the polymer in Holland.

I gather that one of the main difficulties in entering the polypropylene field is the patent position which is very complex.

★ A NOVEL scheme, that might well be extended, should help research workers, who relying on academic or industrial grants, often find it difficult to raise funds for adequate instrumentation. Their position is often complicated by the fact that they need some equipment for limited periods only.

Now Elga Products, Railway Place, London SW19, have introduced a personal loan service to help overcome this difficulty. Under it Mr. W. F. Lorch, managing director, tells me that the Elgastat laboratory deioniser, B102, is now available for 12 months at a charge of £12 12s. This includes a 'liberal supply' of ion exchange resins.

There are no formalities and the instrument will be delivered immediately on written request. This loan service is personal and applies only to individual research workers in the UK and not to corporate bodies or institutions.

★ SEPTEMBER saw the shut-down of the last petrol unit to produce petrol at the hydrogenation plant at ICI's Billingham works. The project, which has been operated on Tees-side for 23 years, has been of the greatest value to ICI for it enabled the company to enter the field of heavy organic chemicals.

Although the plant was opened by Ramsay Macdonald in 1935, when it was the first in the world to produce petrol on a commercial scale from bituminous coal, ICI's interest in the 'coal-oil' process goes back to 1927. It was in that year that the Billingham research department first worked on the process. A large experimental plant started up in 1931 and its success enabled the company to convince the Government that petrol could be produced commercially from British coal and creosote.

Cost was a major problem, but it only needed a tax rebate on 'home-made' petrol to decide the company to go ahead. It was ICI's Victane, a new blending agent, which gave Billingham's petrol sufficient extra quality to put a few m.p.h. on the speed of RAF fighter planes enabling them to catch and shoot down Hitler's 'buzz-bombs'.

After the war, the process was gradually run down and the plant converted to other uses, based mainly on raw materials coming by pipeline from the oil crackers at Wilton.

★ REASONS behind the sale of the Quickfit Group of Triplex Holdings Ltd. to James A. Jobling and Co. Ltd., were revealed by Triplex chairman, Sir Graham Cunningham, in his annual statement. The sale was prompted, reports Sir Graham, by circumstances which had arisen over the years as a result of which the Quickfit Group had only one source of supply of its basic raw material, namely Joblings. Also, as a result of negotiations of a few years ago, Joblings were substantial shareholders in Q. and Q. in the formation of QVF Ltd. and had handed over to QVF the marketing of glass pipeline manufactured by Joblings. This company thereby came into closer personal relationship with the Quickfit Group.

Moreover, since Joblings also manufacture and sell glass beakers, flasks and tubing, etc., to the same customers all over the world, it became obvious that an even closer tie-up was desirable. The whole share capital of Q. and Q. was therefore sold at a price thought reasonable to all concerned. Negotiations for the sale took place with Thomas Tilling Ltd., on behalf of Joblings, as Tillings were Joblings' parent company (see also p. 569 this issue).

The sale has in fact already netted nearly £500,000 for Triplex Holdings in capital gain while the company's shares in Thomas Tillings represent a useful investment in view of Tillings' widespread interests in many branches of industry.

★ THE 1958 annual convention of the Scientific Instrument Manufacturers' Association at Harrogate, 6-9 November, is to be given what the president, Mr. Raymond Barrington Brock, calls a 'new look.'

This year the convention is designed to let the technical and sales staffs of member companies hear the views of customers at first hand. On each of four panels a SIMA chairman will preside over four executives chosen from among important users of instrumentation and laboratory equipment, who are aptly described as 'catalysts to stimulate discussion.' ICI and Unilever are among the user firms who have agreed to provide 'catalysts' for the oil and chemicals panel. Discussion will range over plant and laboratory instrumentation, future trends in automation, instrument manuals, installation and servicing.

SIMA are to be congratulated on such an imaginative approach. Anything that brings the instrument maker into closer contact with the chemical industry user can only lead to a better understanding of the user's problems.

★ CONCERN is shown in the annual report of the Civil Service Commissioners, 1957-58 (obtainable from HM Stationery Office, price 2s net) regarding the lack of well-qualified young entrants to engineering posts. Over half the vacancies in the scientific officer grade of the Civil Service remain unfilled. A fall had occurred in the number of applicants for technical and engineering classes and for posts in the higher scientific classes. Results were also less satisfactory than in previous years.

An attempt had been made by the Commissioners to recruit for Research Fellowships young British scientists who had gone to the US or Canada to do research work there. Useful results are reported.

★ 'TATTLE-TALE GRAY', caused by dirt from laundry water re-deposited on clothes has been reduced by adding CMC (carboxymethyl cellulose) to laundry detergents. How the CMC achieves this and how its action in the washer might be improved, have been sources of contention among chemists in the field for some time. At least, so said Mr. J. W. Hensley, manager of the nucleonics laboratory of the Wyandotte Chemicals Corporation, in a paper at the recent 134th national meeting of the American Chemical Society.

Attempts to measure the adsorption of CMC by cotton have given contradictory results, some finding that it was adsorbed, others that it was not. The amounts involved are so small that they cannot apparently be detected by the usual chemical technique. To shed light on the seemingly simple operation of washing clothes, Mr. Hensley 'tagged' the CMC with radioactive carbon atoms.

First it was shown that cotton would not adsorb CMC from solutions of the CMC in pure water. When detergents were present and a metal was in the solution (such as sodium from salt), it was adsorbed. Wash tests have indicated that adsorption of CMC on the cloth is a definite factor in its action in reducing the re-deposition of soil.

Alembic

FINNISH CHEMICAL PRODUCTION, 1957

Industry Recorded Only a Small Volume Increase in Output

INDUSTRIAL progress in Finland during 1957 is described in the now published yearbook of the Bank of Finland. Reference is made to the worsening situation in the country's economic life. The chemical industry, in particular, which is third in importance of Finland's various industry, appears to have only made a small volume increase in production. (*Teknillisen Kemian Aikakau-Slehit*, 1958, **13.**

Production of chemical pulp is reported as having reached a new peak, passing the two-million-ton mark. Sulphite alcohol production was still rising and reached a volume of 23,418 tons. Sulphate by-products again reached a new production record with 6,254 tons of raw turpentine and 26,000 tons of crude tall oil. A smaller portion was refined, however, than in the previous year, resulting in lower production not only of distilled turpentine and tall oil, but also of tall-oil resin.

New Chlorine Plant

Mr. R. Ornhjelm of the Kymmene company reports that the chlorine plant of the Oulu company has begun operations. Capacity of the plant is 6,000 tons of chlorine a year. Both this company and Finnish Chemicals have increased production capacity which at present are 12,000 tons and 40,000 tons respectively. The total capacity of 58,000 tons of chlorine corresponds to about 65,000 tons of 100 per cent sodium hydroxide. This 40 per cent increase in alkali production is stated to be sufficient to cover the increasing needs of the wood-pulp industry. Demand for alkali has not shown a corresponding increase and must be exported.

Output of the carbide plant of Kymmene Company has been the same as before—9,006 tons. Sodium peroxide production has begun with a present capacity of 10 tons of $Na_2O_2.8H_2O$ per 24 hours. The plant for the production of acetylene chlorides has been modernised.

Production of Finland's nitrogen industry has been dealt with by Mr. J. Lehmus, managing director of the Typpi (Nitrogen) Company. Double working capacity was begun in February 1957. After expansion of the company's plant output of nitrogen totalled 29,892 tons (16,670 tons in 1956). In July 1957 a new plant for the production of mixed granulator fertilisers (capacity 65,000 tons a year) was completed.

Sulphuric acid production in 1957 was 163,306 tons, which was a record (153,476 tons in 1956). This amount was sufficient, stated Mr. Martti Hovi, general manager of Sulphuric-Acid and Superphosphate Factories Ltd., to cover the home market demand. Output of phosphate fertilisers increased to 378,861 tons (360,484 tons in 1956). After completion of three new granulation plants the production capacity of mixed fertilisers totalled 365,000 tons annually, of which amount the Typpi Company produced 65,000 tons. Demand for mixed fertilisers was still larger than output, it was stated. Not all of the phosphate fertilisers produced could be marketed and production had to be restricted. Prices were increased in July by 15 per cent which influenced consumption. Total consumption of fertilisers in 1957 is put at 43,616 tons nitrogen (N); 81,999 tons phosphoric acid (P_2O_5); and 53,294 tons of potassium oxide (K_2O).

Progress in the Finnish plastics industry in 1957 has been reviewed by the dirctor of the Finnish Plastics Association, Dr. J. Pohjanpalo. The import of raw material for the industry totalled 12,526 tons (10,064 tons in 1956) valued at 1,583 million Finnish markka; 88.5 per cent of the total came from western countries. Consumption of the most important raw materials was as follows: phenolics 458 tons; urea-formaldehyde moulding powder 298 tons; melamine 95 tons; cellulose acetate 128 tons; polystyrene 478 tons; polythene 1,048 tons; plasticised p.v.c. 388 tons; unplasticised p.v.c., 1,838 tons; softeners 822 tons; and plastics plates (acrylics, celluloid, hard plates etc.), 171 tons. Total consumption of plastics raw materials amounted to 66,004 tons. These figures cover the affiliated factories of the above mentioned association which represent about 95 per cent of the whole plastics industry in Finland. Total consumption of plastics raw material for all purposes was estimated at 17,000 tons (14,000 tons in 1956). Production of domestic plastics raw materials in 1957 was about 1,610 tons (2,137 tons in 1956), including phenolics, melamine, synthetic adhesives, casein plastics etc. The value of total sales in 1957 was about 3,900 million Finnish markka (about £5 million), an increase of 7 per cent compared with 1956.

Plastics Production, 1957 (tons)

	1955	1956	1957*
Phenol-formaldehyde powder	610	568	377
Urea-formaldehyde	24	—	—
Melamine-formaldehyde	25	12	18
Casein-formaldehyde	89	106	39

* Non-official advance figures.

The viscose-fibre industry was operated at a loss in Finland in 1957 due to unfavourable export prices and decreasing sales towards the year end. Compared with 1956, however, total sales showed an increase of 17 per cent or of 489 million Finnish markka. Total production of viscose staple fibre was 18,598 tons (15,997 tons in 1956). Exports went mainly to the Soviet Union, Rumania and Poland. Home consumption decreased by 211 tons. Viscose rayon filament production was 1,040 tons (932 tons in 1956). Demand for this product fell towards the end of the year and only 68 tons was exported.

Gas production of the Helsinki and Turku Gas Works was noted by the managing director of the Helsinki Gas Works, Mr. Aatu Pöntys. Eleven new horizontal-chamber coke ovens in Helsinki increased production capacity by 80 per cent. Coal consumption increased by 22 per cent. Town gas is now used more than previously as fuel in production processes. Town gas produced totalled 38.8 million m.³ (Helsinki 34.1 and Turku 4.7). Some 112,710 tons of coke were produced (103,057; 9,653) 5,475 tons of coal tar (4,866; 609) and 807 tons of benzene (794; 13).

Consumption in 1957 (tons)

	1953	1954	1955	1956	1957
Phenolics	456	601	665	670	458
Carbonide	138	260	283	296	298
Melamine	69	104	130	143	95
Celluloseacetate	146	169	232	195	128
Polystyrene	236	381	416	546	478
Polythene	48	308	472	866	1,048
P.V.C. plasticised	25	89	127	239	388
P.V.C. unplasticised	741	1,228	1,393	1,727	1,838
Softeners	382	624	684	527	822
Miscellaneous (acrylic, celluloids)	23	22	127	271	171

John Thompson Plant for New Eire Refinery

THE FIRST of three package boilers which John Thompson Water Boilers Co. are installing at the new Irish Refinery Co. left the company's Wolverhampton works last week for Whitegate, County Cork. This first boiler will be commissioned by the end of October to provide the steam required during preparation of the refinery. Each of the three gas or oil fired boilers has an evaporation of 32,000 lb./hr., a working pressure of 150 p.s.i.g., and a final steam temperature of 450° F.

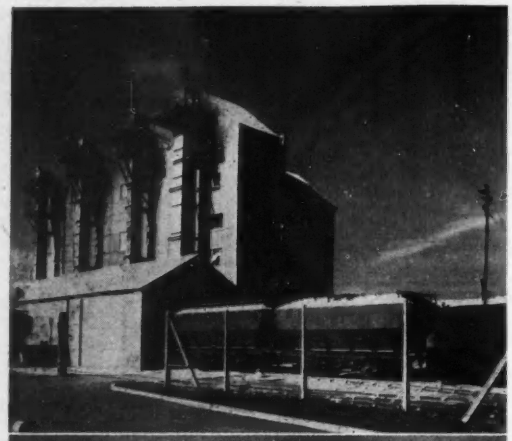
For the refinery, John Thompson-Kennicott Co. are providing the chemical dosing equipment and plant for the pretreatment of raw water for direct make-up and boiler conditioning. The contract, obtained from Lummas, London, includes the supply of a pressure-type aerator for reducing dissolved oxygen in the boiler feed.

Contract for Dunlop and Ranken

Dunlop and Ranken Ltd., Leeds, have received a contract for the works extensions proposed at Urlay Nook, Stockton-on-Tees by British Chrome and Chemicals Ltd. The extensions will cover about 10,000 sq. ft.

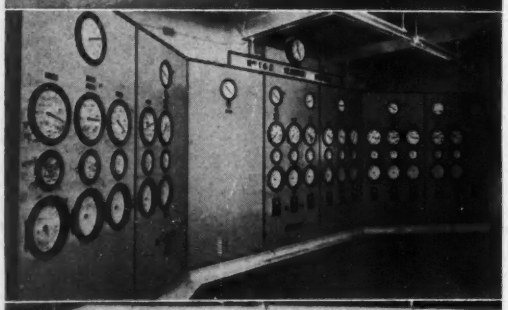
Steetley's Sea Water Magnesia Plant Now Meets All UK Requirements

Large Extension on Stream in Twenty-first Year

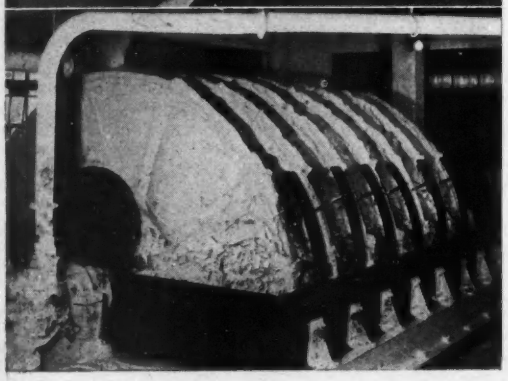


Calcined dolomite brought from the quarries in special covered-hopper rail wagons is slaked to a fine powder in the dry hydrator plant

There are two reactor tanks with agitators and a settling tank with continuously-rotating thickener mechanism in each of the three reactor systems in which the magnesia is precipitated



Flow through the works of 30 million gallons of sea water per day is controlled from this central instrument panel



One of the 11 rotary disc filters with automatic pressure discharge gear passing on washed sludge cake (50 per cent solids) to the rotary kilns where the product is calcined at 1,600°C.

THE HARTLEPOOL works of the Steetley Magnesite Co. Ltd. celebrate their 21st anniversary this year by lifting the annual output of refractory magnesia made from dolomite and sea water from 90,000 to 150,000 tons. This will meet all UK steel-makers' and other demands, provide an exportable surplus, and break the monopoly formerly held by the Austrian magnesite mines.

The millionth ton of 'Britmag'—British-made synthetic magnesite—is scheduled to leave this Co. Durham works in December.

Britmag is a granular refractory material of a minimum 92 per cent MgO content, used for lining and fettling steel furnaces and the making of refractory bricks. It now sells at about £24 a ton delivered anywhere in the UK, a figure 30 per cent below that of imported Austrian magnesite. The £5 million invested in this British enterprise is therefore showing the UK an annual saving of £4 million in foreign currency, as well as earning—even at this early stage—some £1 million from exports.

The chemical process of extracting MgO from dolomite and sea water is anything but complex, but the engineering problems presented by the large-scale processing of the reaction had to be pioneered from the bucket-and-bath-tub scale of the first experiments conducted in a hut in 1937.

Now the 'buckets' hold 2 million gall. each, and the largest of several 'bathtubs' is 225 ft. across and holds 3½ million gall. The whole works now covers 24 acres and uses 30 million gall. of sea water and many hundreds of tons of calcined dolomite each 24 hours.

Planned For Automation

The plant has been developed through the years with ultimate automation in mind. Instrumentation is proceeding apace, all the liquid lines and pumps being controlled by one man at one panel and the entire power supply controlled by automatic power factor equipment.

Apart from a force of day labourers to load and unload, sweep and tidy, and adequate office and administration staffs, the production process is operated by about 18 men per shift.

When the project was mooted 21 years ago by Mr. N. M. Peech, the present chairman of Steetley Magnesite, it was greeted with a good deal of scepticism. Politically he felt the need to make the UK independent of a product

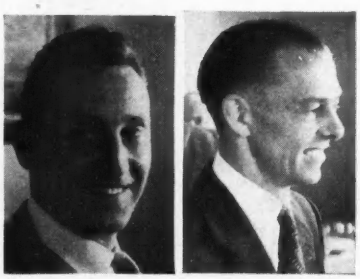
that might at any time become enemy-controlled, and scientifically he was determined to produce from the local and almost infinite resources of dolomite and sea water a high-purity MgO capable of withstanding the higher temperatures that metallurgists aimed to reach.

So the world's first sea-water magnesia unit was laid down in 1938, and within 12 months it was producing 'Britmag' at the annual rate of 4,000 tons. And because the UK had no indigenous deposits of magnesite the strategic importance of the enterprise was promptly recognised by the Government as war became imminent. MgO was in high-priority demand for the production by electrolysis of magnesium metal for incendiary bombs and alloys for aircraft construction.

Today, graded dolomite is burnt on site at the nearby Thrislington and Coxhoe quarries in rotary kilns 300 and 350 ft. long and fired with pulverised coal to yield a magnesium lime known as 'dolime' CaO.MgO. Control equipment and instrumentation is highly developed, and automatic discharge mechanism loads the 'dolime' in covered-hopper rail wagons for transport to Hartlepool where, in a bank of five hydrator units, it is slaked with fresh water to a fine, dry powder, made into a slurry for ease of handling, and then classified to remove impurities.

From this stage on, the only water used is from the sea. Three 950 ft. long jetties of greenheart timber carry cast-iron pipe lines with intake strainers to five 600 h.p. centrifugal pumps. These discharge into four concrete storage tanks with a total capacity of 8 million gall. from which a steady flow of sea water is drawn through the plant whatever the state of the tide.

Mr. T. Kirkup, managing director of Steetley Magnesite, with (l.) Dr. W. C. Gilpin, research director, and (r.) Mr. N. Heasman, technical manager



Before the main reaction, calcium carbonate must first be removed from the sea water, and this is done in five pre-treatment tanks. A small proportion of 'dolime' is introduced and the carbonate is precipitated. The 'softened' sea water is then laundered off into the main reactor systems where it is mixed with major supplies of classified 'dolime' slurry and the precipitation of magnesium hydroxide takes place.

$$CaO.MgO + \begin{cases} MgSO_4 + H_2O \\ MgCl_2 \end{cases} \rightarrow 2\ Mg(OH)_2 + \begin{cases} CaSO_4 \\ CaCl_2 \end{cases}$$

When the dilute suspension of magnesium hydroxide has settled, it is drawn to a centre well by rotating rakes and pumped out as sludge, then washed and filtered in a battery of 11 rotary-disc vacuum filters with pressure discharge gear. The filtering medium is heavy gauge nylon cotton-spun fabric.

The filter cake, containing about 50 per cent solids, is transferred by a conveyor belt to one of the five giant rotary kilns for calcining.

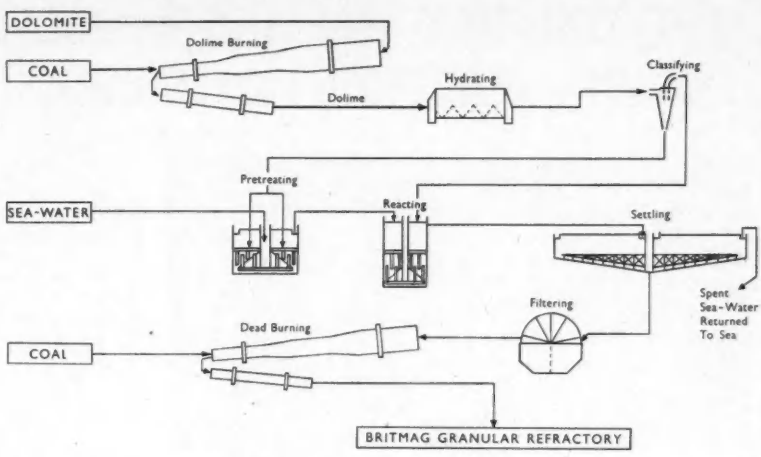
The kilns, the largest of which is 250 ft. long, are fired by pulverised coal and operate at over 1,600°C. The NaCl present in the sea water volatilises off at 600°C.

The final product is a pea-sized grain containing 90-95 per cent MgO and virtually inert to the action of atmospheric moisture. An average percentage composition is MgO 92.4, CaO 2.7, Fe_2O_3 1.4, Al_2O_3 1.4, and SiO_2 2.1.

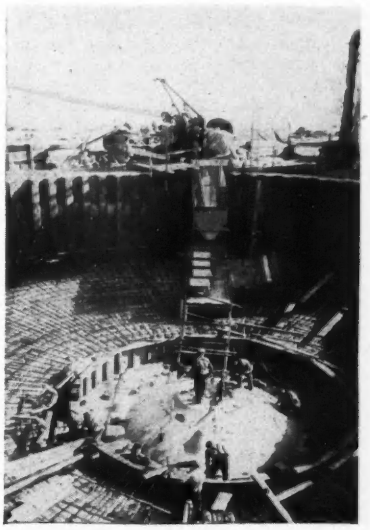
The 'Britmag' production process, from quarry to final loading, is an advanced example of progressive automation. For instance, in the past 10 years, output per man at this works has quadrupled, coal consumption per ton of product reduced by 25 per cent and the average purity of the sample increased to well above the minimum 92 per cent scheduled.

Mr. N. M. Peech, who inspired this project, is still chairman of the company and, with Mr. Thomas Kirkup, the managing director, takes a special pride in the clean and tidy appearance of the estate.

Intelligent design and progressive instrumentation have taken most of the manual labour out of the process; and in the words of Mr. Kirkup, 'We haven't finished yet!'



Flowsheet of the Steetley reaction



With exports in view the setting-up of yet more production capacity goes on. Here another settling tank is under construction inside a cofferdam sunk in the sand

BWRA'S £1¼ Million Research Programme

A FIVE-YEARS' research programme prepared by the British Welding Research Association at the request of DSIR would cost £250,000 a year, and if the necessary financial support is forthcoming from industry it could be under way in two to three years, states the annual report of the association's council.

Major investigations scheduled in the five-years' plan include the problems of heavy steel weldment cracking of the delayed-action type, the welding of steels in the 50-70 tons tensile strength range, molten metal-liquid flux reactions, high current gas shielded welding, and the influence of metallurgical factors and residual stresses on fatigue strength.

SDC ONE-DAY MEETING MARKS DIAZO REACTION CENTENARY

At the symposium, l. to r., J. Boulton, SDC president, Dr. G. P. Warwick (Chester Beatty Research Institute), H. R. Hadfield (ICI) and C. Paine (director, ICI)

A ONE-DAY symposium to mark the centenary of the discovery of the diazo reaction by Peter Griess, was organised by the Society of Dyers and Colourists at the Manchester College of Science and Technology on 26 September. Under the title 'The diazo reaction today,' SDC president, Mr. John Boulton, gave an introductory address.

This was followed by five papers: 'The life and times of Peter Griess,' by W. H. Cliffe (ICI, Manchester), 'The mechanism of the diazotisation reaction,' by Dr. J. H. Ridd (University College, London), 'The mechanism of the couping process,' by Professor W. Bradley (Leeds University), 'The rates of reduction of substituted azo compounds," by Dr. W. C. J. Ross and Dr. G. P. Warwick (Chester Beatty Research Institute, London), and 'The diazo reaction in dyeing,' by H. R. Hadfield and W. F. Liquorice (ICI, Manchester).

Diazo Reaction Today

In his introductory paper, entitled 'The diazo reaction today', Mr. Boulton said that in the new edition of the Colour Index, the dyes which had a diazonium group in their constitution formed by far the biggest section of all groups, taking into account all chemical types of colouring matter.

Apart from the vast number of azoics (in which Griess's reaction was caused to take place on the fibre) nearly 2,000 azo dyes were sold commercially whose constitution was known. The number made by chemists in the past 100 years was probably 20 times that total. Less than 30 years after Griess's discovery, nearly 10,000 individual coloured azo compounds were covered by patents, most of them German.

Mr. Boulton said that Griess ranked among the greatest chemists who ever lived. There was a great deal more to his work than this massive consideration of the dyes containing the chemical grouping which he discovered and which he achieved synthetically.

'In the making of dyes of every class (including those in which there are no diazo groups at all), of drugs and pharmaceuticals, raw materials for the polymer industry, and the general gamut of organic chemicals, it is necessary to make use of Peter Griess's discovery of the diazo reaction in order to produce intermediates although there may be no nitrogen at all in the final product.

'It should not be overlooked in our assessment of Griess's discovery that the simple diazonium salt itself can be converted into a wide range of substituted aromatics to which, even now in a great many cases, his reaction is the only route. One cannot begin to count, or even determine the order of, the number of vital intermediates to which this has applied in the last 100 years and applies even now.

'What has to be remembered about the Griess reaction is that it has probably led to the synthesis of more new compounds than any other single reaction discovery in the realm of organic chemistry, yet it makes use of the most inert of all common chemicals—nitrogen. It is this circumstance more than any other that lights up Griess's discovery with the indescribable touch of genius.'

National Disposal Scheme For Radioactive Wastes?

A NATIONAL disposal service for radioactive wastes might become necessary said Mr. R. H. Burns, of the Industrial Chemistry Group, Atomic Energy Research Establishment, Harwell, at a recent conference held by the Institution of Biology on the effects of pollution on living matter. Mr. Burns said that although no authorisations were at present necessary for the disposal of radioactive waste from users of radioactive material other than the Atomic Energy Authority, there was no certainty that none would be necessary in the future.

A national disposal service would ensure that wastes were handled safely, and would enable benefits obtained by the use of atomic energy to be realised without unnecessary restrictions. It would not seem unreasonable if discharges to sewers were restricted and solid waste was sent to local authorities for disposal on refuse-tips enclosed in containers and buried beneath at least five feet of other material.

The AEA had plans in hand to utilise the energy from waste products.

Pay Increase for Fine Chemical Workers

INCREASES in basic rates in the drug and fine chemical manufacturing industry have been negotiated. The increases are 7s a week for men and 5s for women. The wage structure has been revised, so that the difference between the rates paid to the various grades have been widened in each instance by 2s for men and 1s 6d for women.

With the increase in the basic rate this means that some men in the industry have a total wage advance of 11s a week.

Ethylene Sulphide Gives Polymer Formation on Collagen

THE heterocyclic compound, ethylene sulphide, has been prepared and applied to various forms of collagen, both tanned and untanned. This has resulted in polymer formation to an extent which appears to depend on both the water content of the collagen and the free space available within its structure.

This was stated by Mr. Alan Gill, recipient of the 1958 Donald Burton prize, in his paper 'Shrinkage temperature increases obtained by treating collagen and leather with ethylene sulphide'. Mr. Gill presented this at the annual meeting of the Society of Leather Trades' Chemists held 19 and 20 September at Leeds University, under the chairmanship of Dr. Lionel Goldman, retiring president.

Mr. Gill said that when ethylene sulphide was applied to collagen under optimal conditions, the resulting materials showed no shrinkage on prolonged immersion in boiling water. In addition, treated samples showed a reduction in water vapour uptake. The considerable gain in weight also shown was greater in the case of untanned skin than for chrome, zirconium and vegetable tanned leathers. The amount of material which could be extracted by boiling water from zirconium and vegetable tanned leathers was greatly reduced after treatment with ethylene sulphide.

It was suggested that the observed effects were largely due to the hydrophobic nature of the deposited polyethylene sulphide.

Other papers presented at the SLTC annual meeting were: 'Curing today', by Dr. Mary Dempsey (British Leather Manufacturers' Research Association); 'Leather at Satra—a 20-year review', by H. Bradley (director, British Boot, Shoe and Allied Trades' Research Association); 'Efficient drying of heavy leather', by N. Shaw and N. G. Davies; Procter memorial lecture: 'Contribution of clinical and experimental pathology to our understanding of dermis', by Professor R. E. Tunbridge (Leeds University); 'Studies of the water absorption of sole leather', by Dr. J. P. Danby (principal, National Leathersellers' College) and R. Porter.

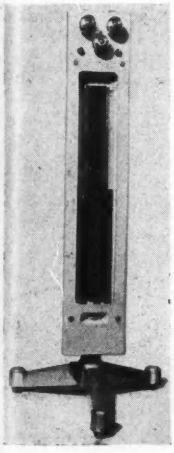
EQUIPMENT REVIEW

Chemical Plant: Laboratory Apparatus: Safety and Anti-corrosion Products

GREASE RESISTANT CONVEYORS CONVEYOR belting which resists the action of grease, oils and lubricants as well as heat is now being made by **David Moseley and Sons Ltd.**, Ardwick, Manchester, using Hycar synthetic rubber. This type of belting is specially useful for the conveyance of greasy foods such as chocolates and biscuits, oil-covered machine components and spare parts, and vegetable oil products.

This non-toxic belting is built up of five plies of cotton duck laminated together and faced with Hycar oil-resistant synthetic rubber made by British Geon Ltd.

VERSATILE LOW-PRICED MANOMETER A VERSATILE low-price manometer which can be simply and quickly arranged for flush panel, wall mounting or (with special stand) for laboratory bench work, has been developed by **Refinery Equipment and Speciality Co. Ltd.**, Eccles, Manchester. It is intended for the measurement of pressure, differential pressures and levels at system pressures up to 100 p.s.i.g.



Manometer for laboratory bench work

Special features include the provision of two line isolating valves and one equalising valve, fully shock-proof construction and a simple, foolproof system for filling and venting the measuring fluid used.

Three standard instruments are available with scales of 6 in., 12 in. and 24 in. respectively. A free travel of 1 in. on each scale permits easy zero adjustment. The cast aluminium case of the manometer is provided with two 'built-in' safety features—a transparent, plastic front and an adequate drainage hole.

HIGH IMPACT PIPING FROM GEON PVC HIGH impact p.v.c. piping many times tougher than ordinary p.v.c. piping is now being manufactured in a wide range of diameters, from ½ in. to 12 in.—by **Extrudex Ltd.**, Bracknell, Berks.

The piping, which is made with Geon RA.170 and sold under the trade name 'Hipact,' is non-corrodible and can withstand heavy blows one-fifth the weight of steel pipe, it is self-coloured and needs no painting.

The girl seen here is holding Hipact p.v.c. piping made with Geon RA.170, which is one-fifth the weight of steel pipe

This extra-tough piping is said to be ideal for use under corrosive conditions where there is also risk of mechanical damage as in chemical works and oil refineries and piping for water, gas and effluent.

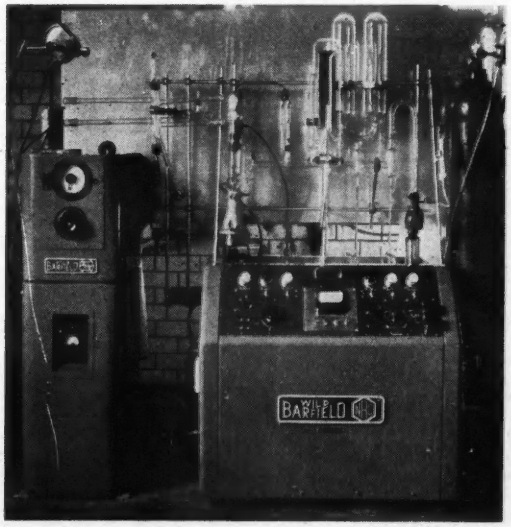
VACUUM HYDROGEN ANALYSER THE NEED for equipment to determine, rapidly and precisely, the hydrogen content of titanium, zirconium and similar metals and alloys led to the development of the Wild-Barfield hydrogen analyser model 917, manufactured by **Wild-Barfield Electric Furnaces Ltd.**, Elecfurn Works, Watford, Herts.

Using approximately quarter-gram samples in any solid form, the apparatus has a range of from 5 to 700 parts per million, with a precision equal to or better than that obtained from hot extraction in the vacuum fusion apparatus. The analyser can be operated by any competent laboratory technician, a complete analysis taking from 4 to 10 minutes.

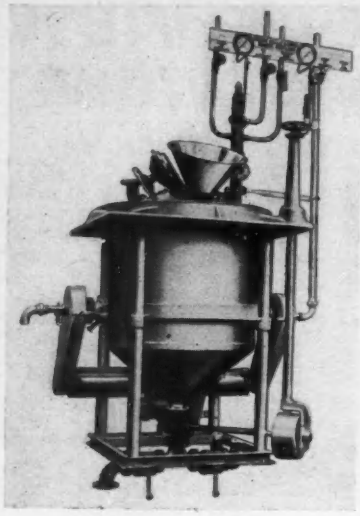
The apparatus works on the principle of hot extraction of hydrogen in a vacuum. An induction-heated quartz furnace of original design permits the rapid removal of the hydrogen from the samples, and has extremely low outgassing characteristics at elevated temperatures. A special Pirani recording gauge records on a strip chart the amount of hydrogen evolved from each sample. The operating controls are set in the top of the cabinet which houses the vacuum pumps and mercury wells.

Induction heating is used in the furnace assembly for the rapid attainment of 1,400°C, at which temperature the hydrogen is removed completely and rapidly, regardless of alloy content. A magnetically-operated crucible assembly allows the sample to be dumped into a cool receptacle after completion of an analysis to ensure that it will not evolve further gases.

UNORTHODOX STEAM-HEATED AUTOCLAVE FROM **Robert Kellie & Son Ltd.**, of Dundee, comes a new all-purpose autoclave originally designed for processing fruit pulps, jams, jellies and juices by means



Wild-Barfield's new vacuum hydrogen analyser, model 917



All-purpose autoclave

of steam and compressed air or steam vacuum arrangements. It is now being marketed in the chemical industry.

The main point of the Kellie patent is that the machine has no steam jacket, the processing being achieved by means of a steam-heated revolving unit incorporating a swash plate impeller. The rotating movement continually cleans the heating elements. The proportion of heating surface to volume is 50 per cent greater than that of the orthodox steam jacketed autoclave, and any possibility of local overheating or skin burning of the product being processed, pitting or erosion, is obviated.

A feature of the new autoclave of interest to the chemical industry is that there is no danger of metallic contamination of the product while in the apparatus.

AUTOMATIC DUST COLLECTOR

MANUFACTURING rights in a new type of automatic dust collector for the recovery of dusts of little or no commercial value have been acquired by the **Visco Engineering Co. Ltd.,** Stafford Road, Croydon, Surrey, and the apparatus is now being marketed under the trade-name 'Bermax.'

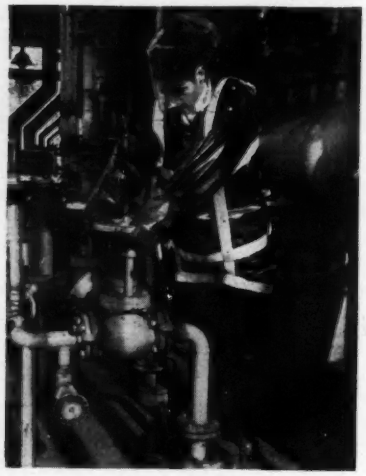
The collector comprises a heavy gauge sheet steel casing, hopper and common-inlet expansion chamber, constructed in modern flanged panel formation, the casing and hopper being divided into compartments according to capacity. Each compartment houses a spring-mounted filter bed consisting of a primary cell filled with steel shavings and a secondary cell filled with stone chippings, graded according to the dust loading and particle size of the material handled.

Each filter bed is connected to a shaker motor, and the hopper is fitted with a spiral conveyor and a rotary air lock dust discharge valve. Isolating dampers are operated by compressed air cylinders.

On the start of the cleaning cycle, the automatic control panel energises the solenoid valve of No. 1 compartment which closes the isolating damper. A few seconds later the shaker motor is brought into operation, vibrating the filter bed for some minutes. The motor then stops and after a few seconds delay the isolating damper opens and the compartment is brought back into service. After a further delay of several minutes the cleaning cycle is repeated on No. 2 compartment, and so on.

TERYLENE-PVC SAFETY SUIT

A SAFETY suit of p.v.c. coated Terylene made by **R.F.D. Co. Ltd.,** Godalming, Surrey, seals off the wearer from toxic fumes, vapours and dust while providing for the circulation of



Opal suit mk. I

cool fresh air to all parts of the body through an external pipeline. The transparent hood is of p.v.c. sheeting.

Air enters the suit at the waist and is exhausted through non-return valves in the arms and legs. The hands and feet of the suit, over which suitable gloves and boots are worn, are sealed off with p.v.c.

An optional extra is an integral Terylene webbing lifting harness which allows the wearer to be hauled bodily to safety in an emergency.

ELECTRONIC THERMO SWITCH

JUST RELEASED for sale to industry is a newly-developed electronic thermo-switch by **A. M. Lock and Co. Ltd.,** Oldham, Lancashire. The temperature elements, consisting of a platinum winding housed in a thin stainless steel tube, are interchangeable and highly sensitive.

The instrument is designed to maintain temperatures at a pre-set value, giving immediate relay action at any tendency to deviation. Any variation of temperature results in the platinum sensing element producing an out-of-balance signal in the electrical bridge network, either in or out of phase with the bridge voltage. The signal is then amplified and applied to a phase-sensitive detector which operates a heavy-duty control relay making or breaking according to whether the measured temperature is lower or higher than the pre-set position on the control knob.

Available for use in the temperature range −200°C to +500°C, the on/off control action operates on a temperature differential of ±0.1 per cent of range coverage.

MAGNETIC COOLANT CLARIFIER

NOW AVAILABLE from stock is a new range of Philips coolant clarifiers incorporating the 'Magna-Drum'—a magnetic drum of unusual design made of ceramic magnetic material pioneered by **Philips Electrical Ltd.,** Century House, Shaftesbury Avenue, London WC2. The ceramic 'Magna-Drum' is highly magnetic over its entire surface. It is claimed that its magnetic field is so intense and the fluid to be filtered so controlled that a high proportion of grinding abrasive is always contained in the swarf collected on the drum's surface. The swarf is removed by specially designed scrapers.

Straight cutting oils or soluble oil coolants can be filtered without modification to the unit which is claimed to be smaller and more compact than any other existing magnetic clarifier of equivalent capacity.

NEW FACE SHIELD

Overhead harness for the new general-purpose Parmalee face shield is avoided by the incorporation of a featherweight, p.v.c.-covered stainless steel headband, bonded with washable Sorboprene cushion lining, which fits against the wearer's forehead. This gives the wearer freedom of head movement and permits personal spectacles to be worn. Manufacturers are Parmalee (GB) Ltd., Bedford Avenue, Trading Estate, Slough

Uses for Glycerine Derivatives Noted in New German Patents

THREE German patents are noted in *Glycerine News*, 1958 (September), in which glycerine derivatives are used in a variety of applications. German Patent Application 1,024,654 refers to unsaturated glycerol derivatives providing further or alternative sources of unsaturation in polyesters which may be cross-linked with vinyl monomers. As an example, glycerol α-allyl ether is reacted with butanediol, maleic and phthalic anhydrides to yield such polyesters which can be used in adhesives and solvent-free air drying lacquers.

Lack of peneration found when using fully condensed sulphonated acid resins for textile fabric impregnation can be remedied, it is reported (German Patent Application 1,021,825), by using treatment baths containing a partial water-soluble condensate of fatty acid monoglyceride, e.g. glyceryl monoleate, with a degree of sulphonation of 60 to 70 per cent. Fabrics impregnated with the liquid are dried and condensed at a temperature of 160°C optionally after calendering at a temperature of about 200°C.

A silk-like feel and anti-static properties can be acquired by synthetic or natural textile materials after treatment with an aqueous emulsion with a lanolin base of 10 to 60 per cent (German Patent Application, 1,004,584). Stockings are treated for five minutes in a bath which contains 8 per cent (of the material) of lanolin, 15 per cent (of the lanolin) of disteoaryldimethyl ammonium chloride and 5 per cent (of the lanolin) of polyglyceryl monostearate and to which 0.5 to 1 per cent (of the material) of alkali-neutralised sulphonated caster oil is added at a pH of 8, a bath ratio of 15:1 to 30:1, preferably of 20:1, and at 32° to 38°C.

Two New Circular Pipe Flow Calculators by Fearns Mear and Co.

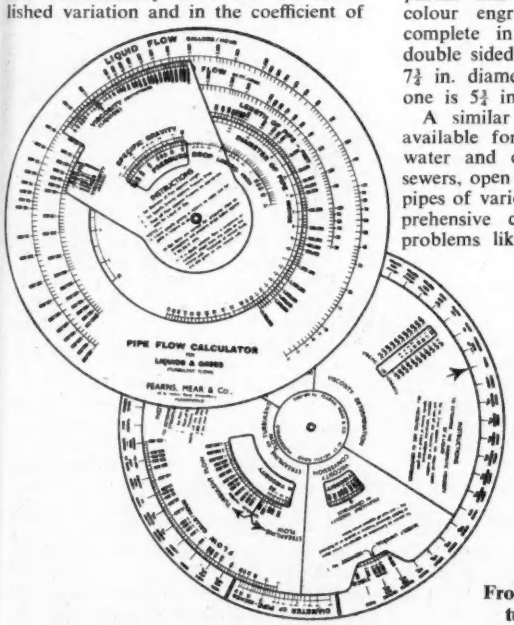
TWO new calculators of the circular slide rule type for determining the flow of liquids and gases through pipe lines have been introduced by Fearns, Mear and Co., 43 St. Helens Gate, Huddersfield.

These calculators it is claimed, quickly and accurately give the rate of flow, pressure drop or required pipe size for all fluids, one instrument dealing with turbulent flow conditions and the other with the streamline flow of viscous liquids. They take into account the viscosity and specific gravity of the fluid and automatically allow for the established variation and in the coefficient of friction according to the velocity and pipe size so that their use is extremely simple.

The turbulent flow calculator deals with the majority of practical cases and has on the reverse side viscosity figures at various temperatures for a wide range of liquids, together with scales to confirm whether the flow is turbulent or streamline and also viscosity conversion scales.

Suitable for pipes from 0.1 in. to 40 in. diameter passing from 0.1 to 1,000,000 gal. per hour, they are made in transparent and white Perspex with two-colour engraved scales, and supplied complete in cloth covered cases. The double sided turbulent flow calculator is 7¾ in. diameter, while the viscous flow one is 5¾ in. diameter.

A similar instrument, shortly to be available for dealing with the flow of water and covering large ducts, brick sewers, open channels etc., in addition to pipes of various materials, will give comprehensive coverage to all pipe flow problems likely to be met in practice.



Front and reverse sides of the turbulent flow calculators

Courtaulds — Du Pont Agreement On Taslan Textured Yarns

AN agreement has been concluded by Courtaulds Ltd. with E.I. Du Pont de Nemours and Co., US, for a licence under the Du Pont patents for the manufacture of Taslan textured yarns. The agreement also provides for access to the Du Pont 'know-how' and gives the right to apply the trade mark 'Taslan' to Courtaulds textured yarns in home and overseas markets.

A number of licences has already been granted by Du Pont to operate the Taslan textured yarn process, particularly in connection with acetate, triacetate and synthetic yarns. The process gives greater bulk to the yarn, thus making it suitable for a wider range of fabrics for clothing and furnishing purposes. Courtaulds have developed a special technique for crimping continuous filament yarns which gives them enhanced resilience and recoil after stretching and the trade mark Courtolon was applied to them. This process was originally used only on nylon, giving increased warmth and bulk 'to fabrics made from the yarns'.

It is understood that Courtaulds are ready to use the Taslan process immediately.

German Synthetic Rubber to be Marketed in UK

FORMATION of a company in the UK to be called Rubber Plastics has been announced by Lemforder Metallwarengesellschaft mbH, Camp Bird Industries and Knight Lockhart and Co. The shareholding is divided equally between the German and British participants. Members of the board of the new company will be Lord Keyes, Mr. D. J. Ulderop, Mr. A. W. M. Hartley, Major J. C. du Parc Braham, Mr. R. K. Reynolds, Dr. G. Reuter and Mr. R. R. Pappier.

Lemforder are the largest Germany company processing the polyurethane group of synthetic rubbers. The rubbers will be manufactured and marketed under the trade names of Vulkollan (the registered trade mark of Farbenfabriken Bayer AG, Leverkusen) and Rublastic. Manufacturing and processing will take place at Rubber Plastics Works, Upper Basildon, Berks. Production is scheduled to start at the end of this year.

UK Firms to Build Portuguese Cellulose Plant

A cellulose plant is to be built by Millspaugh Wimpey Ltd. (Millspaugh Ltd., of Sheffield plus George Wimpey and Co.) at Tejos, near Setubal, Portugal. It will be operated by a company founded in Lisbon recently as Sociedade Industrial de Celuloses (SOCAL). Use will be made of eucalyptus trees which abound in Portugal, and it is estimated that the plant will have an initial capacity of 60,000 metric tons a year when it comes into operation in 1961. Capital invested amounts to Esc. 400 million (about £5 million).

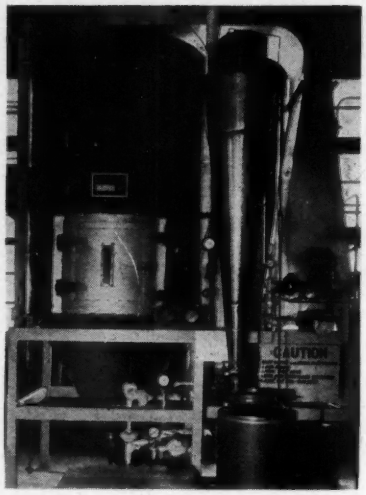
NEW SPRAY DRYING UNIT FOR AMERICAN CYANAMID

IN view of the success of a battery of spray driers specially designed for use with chemicals, a further unit of semi-works size has now been installed at the Bound Brook, New Jersey, US, plant of the organic chemicals division of the American Cyanamid Co. The new unit will enable further experimental work to be carried on and provide a plant capable of handling small throughputs for the production line.

American Cyanamid played a leading part in the development of spray drying for the chemical industry in the US. In collaboration with the Bowen Engineering Inc., New Jersey, the company installed a laboratory-size spray drier to investigate the drying of dyes, pigments, organic and inorganic pharmaceuticals, plastics, rubber chemicals, etc. This work led to the first-full-scale spray drier at Bound Brook and later to the installation of a battery of driers.

The principle of operation of the spray drying technique is basically the same, irrespective of size. The chemical to be dried is fed in the form of a filtered slurry into the drying chamber where it is atomised by a centrifugal wheel rotating at 20,000 r.p.m. A fan at the end of the collection cycle creates the suction which draws the product through a warm air current. The heated drying air enters the unit around the centrifugal wheel, picking up the moist particles, drying them down to a fairly low moisture content.

Further dehydration occurs during the passage of the powder through a conical-bottomed drying chamber to the collectors. The time taken from feed entry into the unit and its exit as a dry powder takes only a few seconds. The cooling effect induced by the evaporation of the water keeps the product comparatively cool, thereby obviating any harmful effects on the product.



Bowen pilot plant spray drier at the Bound Brook, New Jersey, works of American Cyanamid

For drying extremely heat-sensitive chemicals, a shock-cooling effect is obtained by introducing cold air into the drying chamber through inlets in the chamber walls. The dried product is collected in a cyclone collector and is automatically controlled. The process is automatic and continuous. Constant conditions are ensured, but should any deviation occur, the operator is instantly alerted.

To prevent overheating of the high-speed centrifugal wheel, it operates in a water-jacketed housing. All parts in contact with the product are of stainless steel. Access to the interior is gained through a door in the side of the drying chamber.

Wiggins Teape New Paper Mill Uses Neutral Sodium Sulphite Process

THE neutral sodium sulphite process is used to treat home-grown hardwood at the new Sudbrook Pulp Mill, near Chepstow, Mon, of the Wiggins Teape Group. This is the first mill to be built in the UK capable of producing woodpulp for papermaking from home-produced hardwood.

The process, a British invention of about 100 years ago, is ideally suited both to the high quality paper, Gatecel, produced at Sudbrook, and for the pulping unit consuming 50-70,000 tons of hardwood a year. After barking and chipping, the wood is treated with neutral sodium sulphite, which acts on the unwanted contents of the pulpwood, such as lignin, enabling them to be removed, leaving the cellulose and semi-cellulose undamaged. This method is said to give a higher yield of fibres than other processes.

The mill, on the north side of the Severn tunnel, utilises a water supply of between 14-34 million gall. a day pumped from a spring beneath the tunnel and which has previously been run to waste in the Severn estuary. Wiggins Teape will buy the water from British Railways under a 99-year agreement, during which time they will pay nearly £1 million for the water.

The process does not make it possible to recover the main digestion liquor and effluent is stored in a reservoir at the mill. The abnormally high tides of the estuary make possible the release of effluent during outgoing tides, which are extremely fast running.

Gas Chromatography Of Light Hydrocarbons And Inert Gases

AN ANALYTICAL method for gases containing light hydrocarbons (C1 to C4 inclusive) and inert components such as CO_2, CO, N_2, O_2 and H_2, has been described by Dr. J. Rombaut and C. Foderrie of Esso Belgium refinery, Anvers, Belgium (*Industrie Chimique Belge*, 1958, **23**, No. 8, 845). The principle of the method is based on a separation by gaseous chromatography.

The mode of operation includes two stages. During the first, analysis of the hydrocarbons and carbon dioxide is carried out. This separation is obtained at 30°C by means of a partition column containing a mixture of tetrabutylene and crushed refractory brick.

The second stage comprises the analysis of the inert gases by means of a column containing molecular sieves. It is stated that it is essential to prevent the introduction of the hydrocarbons (higher than methane) and of the carbon dioxide in the column containing the molecular sieves. For this purpose a system of filters has been provided for, in order to eliminate as a preliminary the unwanted elements.

Helium is used as carrier gas and in quantitative analysis of the hydrocarbons, nitrogen is used as standard. The nitrogen is injected immediately before or after the analysis of inert gases and serves to establish a correction factor for the variations in conditions of analysis.

Dunlop PTFE Hose for Aircraft Industry

HOSE made of polytetrafluoroethylene by Dunlop is finding many uses in the aircraft industry—in hydraulic systems and for the conveyance of gases and fluids of all kinds, even concentrated hydrogen peroxide and other liquid rocket propellants.

The hose is being produced in sizes from 1/16 to 1 in. bore and in lengths up to 15 ft. Advantages of p.t.f.e. are that it can withstand temperatures ranging from −70° to −250° C., it is more resistant to corrosion than any other known flexible plastics material and it is unaffected by any known solvent. It neither absorbs water nor deteriorates to any noticeable degree when exposed to the weather, is light in weight and relatively strong. Braided with stainless steel wire for reinforcement, it can be used at high working pressures. The smaller bores are coming off the production line now, and it is understood that the larger sizes will be available from stock shortly.

New Tanker Uses Butyl

The *Esso Durham*, a 36,000-ton super tanker, built by Vickers-Armstrongs and handed over to Esso Petroleum on 19 September, is the first of its class to be wired throughout with butyl rubber insulated cables, amounting to some 23 miles and over 7,000 lb. of butyl. The incentive for this new development is an anticipated longer life for the insulation coupled with higher current ratings and resistance to ambient temperatures.

Overseas News

US INTERIOR DEPARTMENT TO BUILD NEW HELIUM PLANT IN OKLAHOMA

FUNDS totalling about $12 million have been approved by the US Congress to enable the Department of the Interior to build a new helium plant in the Keyes natural gas field, Cimarron County, Okla. Specifications for a plant capable of processing a maximum of 70 million cu. ft. of natural gas daily, which would mean a yearly output of from 200 to 290 million cu. ft. of helium, have been drawn up. Building will begin as soon as possible, as helium is needed to alleviate a severe shortage.

The current US annual consumption of 350 million cu. ft. is 70 times the amount used 20 years ago and the four helium plants operated by the US Bureau of Mines cannot keep pace with growing needs. Although adding the Keyes plant could boost total output to about 600 million cu. ft. a year, it is believed that even this amount would fall short of the estimated 1960 demand.

However, an ambitious helium-conservation programme would permit recovery of some 3,000 million cu. ft. a year of helium which is now lost when natural gas is burned as fuel. Under the programme, industry would be encouraged to build plants that would extract helium from natural gas before it goes to fuel markets. The Government would purchase and store the helium.

Mexico's Production and Usage Of Sulphuric Acid Up

Production of sulphuric acid in Mexico last year increased to 246,984 tons from 191,545 tons in 1956. Consumption, at 247,721 tons, compared with 194,173 tons the previous year. Output of ethyl alcohol rose from 39.9 million litres in 1956 to 44.3 million litres last year. Caustic soda production rose from 25,589 tons in 1956 to 334,139 tons last year, while production of fertilisers increased from 237,581 tons to 270,933 tons in 1957. Consumption of fertilisers jumped from 370,560 tons to 425,091 tons last year, with imports up from 133,069 tons to 154,158 tons last year.

Record Production and Sales Volume Forecast for Canada

That output and sales in Canada will reach a record volume in the next three months and that gross national product for 1958 will reflect one of the best years in Canada's history, is the forecast of Ronald B. MacPherson, economist of Du Pont Co. of Canada (1956) Ltd. He warned, however, that various economic difficulties and downtrends loomed ahead which would act as a brake on recovery in the coming year, though he foresaw that, on balance, gross national product for 1959 would surpass that of this year. He cited intensified competition arising from excesses of supply over demand in foreign markets for many raw materials exported by Canada.

Excess capacity in manufacturing industry, and uncertain profit prospects, would militate against an early revival in industrial expansion, it is suggested, while economic progress in both Canada and the US could be retarded by labour disturbances.

Industry was reported as ordering more freely than had been the case for some time.

Bayer Artificial Fibres for Italy

Farbenfabriken Bayer are reported to be launching in Italy the sale of their new artificial textile fibres Dralon and Cuprama. These fibres will not be manufactured in Italy but marketed through CO-FA in Milan.

BASF HCl Plant Conversion

Badische Anilin-und Sodafabrik AG, of Ludwigshafen, have turned over the whole of their HCl-plant to the production of hydrochloric acid by adiabatic absorption of hydrogen chloride-containing gases.

This process, developed by BASF, and already in use at 60 plants in Germany and abroad, is claimed to be cheap, necessitate the use of little power and no cold water processing, and permits a high yield, as well as the opportunity for obtaining valuable by-products.

Chromium Catalyst for Polypropylene

Properties of polypropylene made with chromium trichloride-trialkylaluminium are claimed to be equal to those of polypropylene made with titanium trichloride-trialkylaluminium catalysts. Reporting this, J. F. Gillespie and J. W. L. Fordham of Diamond Alkali, US, state that the main advantage of chromium trichloride is that it can be handled exposed to atmosphere at temperatures up to 200°C.

For polypropylene to polymerise at a good rate, a high chromium trichloride content in the catalyst is required. Preliminary investigations have indicated that chromium trichloride may permit tailoring of properties through polymerisation.

New Electronic Recording Device for Radiochromatography

Dr. Marco Frank of the *Istituto Superiore di Sanita'* in Rome reports that the physics laboratory of his institution has built 10 sets of radiochromatography apparatus which records on paper. (Radiochromatography enables a substance present in infinitesimal quantities in a solution—a few one-millionths of a gramme—to be determined).

The apparatus in question is based on Geiger counters, an electronic scanner, an electronic recorder, and an electric typewriter. The first machine of this kind built by the Institute has been used for over 12,000 hours with very little need for special upkeep or repairs.

Italian Sulphur Output and Prices Decline

During the first six months of 1958, 83,137 tons of sulphur were produced in Italy, or about 5.3 per cent less than the 87,753 tons recorded in January/June 1957. During the same period, Italian exports of sulphur totalled 20,362 tons or 77.2 per cent less than the 89,102 tons recorded in January/June 1957. Prices of sulphur decreased from 25,726 lire per ton recorded during the first half of 1957 to 22,837.

German Work on Terephthalic Acids from Toluol

A large amount of chemical research will be carried out at the Essen headquarters of Bergbau-Forschung GmbH (Mining Research GmbH) now officially opened by its sponsors, the West German coal-mining industry. In the centre's chemical section work has begun on the development of a process for the production of terephthalic acids from toluol and the de-acidisation by pressure of coke-oven gases.

US Pfizer's $1 Million Deal with Hungary

Mr. John J. Powers president of the Pfizer Co., US, and Mr. Robert Collard, manager of the Belgium branch of the company, have concluded, with Medimpex, the Hungarian State trading company for pharmaceuticals, a $1 million deal. Hungary will supply pharmaceutical products for the US company, and Pfizer will deliver basic materials for Hungary's pharmaceutical and drug industry.

Natural Gas for the Italian Chemical Industry

According to data published in Milan, the Italian chemical industry consumes natural gas in the following proportions (in thousands of cubic metres):

	1954	1956	1957
As fuel	378,198	560,000	591,243
Percentage of Italian consumption of gas	12.8%	12.07%	12.3%
For processing ...	207,197	335,000	359,470
Percentage of total consumption ...	7.1%	7.4%	7.5%
In rubber industry ...	65,392	86,000	87,605
Percentage of total consumption ...	2.2%	1.9%	1.8%

From the above figures, it appears that during the period of four years, the utilisation of natural gas as a fuel in Italian chemical industry has grown by nearly 60 per cent while its use as raw material has risen by 73 per cent. During

the same period, consumption of natural gas by the rubber industry has increased by 34 per cent and a considerable further increase is expected when ANIC's factory in Ravenna is in full operation.

Production of Ethylene in Italy by 1960

According to calculations made by Professor Carlo Padovani of the Polytechnical Institute, Milan, the production of ethylene as by-product of petroleum industry will reach the following figures in Italy by 1960:

	Tons
Montecatini (Ferrara)	25,000
Sicedison (Mantua and Sicily) ...	13,000
ABCD (Ragusa)	12,000
Solvay (Rosignano)	10,000
ANIC (from natural gas)	16,000
Cokeries (from coal)	4,000
Total	80,000

New Resin Coating Process

Polymer Processes, US, have developed a new process, the Whirlclad finishing technqiue whereby metal parts can have a uniform vinyl coating. The new powdered vinyl resins for use with the process are produced by National Polymer Products, under the trade name Corvel.

Metal parts to be clad are preheated to a temperature above the flow point of the vinyl resin, then dipped into a fluidised bed of the dry powdered resin. Resin encapsulates the object and bonds by fusion on to the metal surface. In a single dip, a uniform thickness of 10 to 50 ml. is built up. As no solvent is used, no drips, sags or pock marks occur, it is claimed, and heat fusion holds the finish on edges, corners and projections.

E. German Polymethacrylate

East German state-owned Stickstoffwerk Piesteritz have announced that they have now brought into operation a plant for large-scale production of Piacryl P, a polymethacrylate similar to Plexiglas. Since 1955 an experimental plant has been producing the substance in small quantities. Now a full-scale plant has begun production using a method devised by the company itself, which is stated to be able to produce 'several ten thousands of square metres' annually. The plant has been so built that it can be extended as required.

US Chemicals Revert Downward Sales Trend

Activity in the US chemical industry increased during the second quarter of this year and sales for May, at $1,865 million, were higher than in the previous month. This was the second successive month in which sales showed an increase, indicating that the downward trend of the latter part of 1957 and early 1958 has now been reversed. The US Federal Reserve Board's production index also indicated a one point rise in April.

The industry believes that the upward sales trend will continue into early 1959, easing pressure on profit margins.

US chemical producers expect to spend $1,388 million on new plant and equipment during 1958, according to a survey conducted by the US Department of Commerce and the Securities Exchange Commission. Despite a considerable reduction from an earlier estimate of $1,621 million, the reduced figure for capital expenditure has been exceeded only during 1956 and 1957. Capital spending in the second quarter of 1958 was increased to $372 million, but was 14 per cent lower than for the same period of 1957.

Shell Petrochemical Plant for Australia

Shell are to set up a new £A600,000 petrochemical plant at Clyde, Sydney, Australia. It will be Australia's first plant for the manufacture of epoxy resins which will be marked under the trade name Epikote. These resins will be made in solid and liquid form.

Epikote resins which have extensive applications in paint manufacture and allied fields, are also manufactured in Cheshire in the UK, the US, Germany and Holland.

New Styrene Monomer Plant for Japan

Further expansion of plastics and synthetic rubber industries in Japan is foreseen as a result of close technical cooperation between US and Japanese manufacturers. A new styrene monomer plant, now under construction by Asahi-Dow Ltd., will supply the existing raw material needs for polystyrene production in Japan with additional capacity available for synthetic rubber production.

The new plant is located at a large refining and petrochemical centre in Kawasaki, an industrial complex between Tokyo and Yokohama. The plant is expected to go on stream early in 1960. Asahi-Dow was formed six years ago by the Dow Chemical Co. and Asahi Chemical Industry Co., to produce saran, saran filaments and polystyrene.

New US Process for Higher Alcohols

By means of a new process developed by Continental Oil Co., US, straight-chain primary alcohols will be obtained from petroleum. The alcohols will contain even numbers of carbon atoms from six to 18 and possibly even higher. Previously only natural oils and fats were used as starting materials for these products.

Conoco plan to build a plant to make the alcohols, trade name Alfols. Details of the plant and process have not yet been released.

New Dow International Sales Company has HQ in S. America

The Dow Chemical Co., Midland, Mich, have formed a new overseas subsidiary company in Venezuela to handle their international operations.

The wholly-owned subsidiary, Dow Chemical International Ltd., SA, will consolidate overseas sales of Dow products and administer Dow business interests and investments abroad.

West Germany's 8.5 per cent Increase in Chemical Imports

FOR the first time in several years, imports of chemicals into West Germany are now increasing at a greater rate than export figures, the Association of German Chemical Industry stated in Frankfurt on 30 September. In the first half of 1958 exports had risen by DM 34 million (about £2,840,000) on totals for the same period of 1957 to DM 2,230 million (about £186 million)—an increase of 2 per cent—while imports increased by about 8½ per cent, rising by DM 64,500,000 (about £5,375,000) to more than DM 829 million (about £69 million). Imports have thus broken all previous records.

Many branches of the German chemical industry have reached, in the Association's own words 'either a state of stagnation or a state of reaction'. Examples of these are the aniline dye industry, traditionally a big exporter, whose exports fell in the period under report to DM 141 million (about £11¾ million)—a fall of 16 per cent on 1957 figures, and the cellulose industry, which suffered a 25 per cent decrease. Exports of mineral paints and dyes, glue and gelatine, dyestuffs in general and other smaller branches left 'much to be desired'.

Exports which continued to expand at a remarkably speedy rate included nitrogen fertilisers, overseas sales of which rose by 40 per cent on 1957 figures to DM 194 million (about £16¼ million), and pharmaceutical and photographic chemical products, export sales of which were 16 per cent up on 1957 totals.

These imports of finished and semi-finished products rose in import value by DM 100 million (about £8,330,000) on the first half of last year to a total of DM 707 million (about £59 million). Imports of raw materials fell in the period under review by DM 36 million (about £3 million) to DM 122 million (about £10 million)—a drop of 22 per cent. This is said to be due to the overall slump in world raw material markets.

Greatest increases in import totals have occurred in the fields of finished chemicals and plastics. Import of chemicals went up by DM 29 million (about £2½ million) to a total of DM 140 million (about £11,670,000), an increase of 24 per cent. Against this, export figures for German chemicals fell below totals for the first half of 1957, to DM 523 million (about £43¼ million). Pharmaceutical products rose by 13 per cent to about DM 70 million (about £6,850,000) on comparative 1957 totals. Other imports the volume of which increased included photographic chemical products, varnishes and cosmetics.

PEOPLE in the news

● MR. F. C. HYMAS, chief chemist of Spratt's Patent Ltd., Laboratory, Morris Road, London E.4, has been nominated chairman of the London section, Royal Institute of Chemistry, the annual meeting of which will be held at the Royal Society of Health, 90 Buckingham Palace Road, London SW1, on 19 November at 6.30 p.m. MR. P. A. RAINE, chief chemist, Johnson and Phillips Ltd., Charlton, London SE7, has been nominated vice-chairman. MR. P. F. CORBETT has been nominated to continue in office as hon. treasurer. Nominations have been invited to fill seven vacancies on the committee.

● MR. P. STANLEY BRIGGS (T. N. and E. H. Briggs Ltd., Leicester) was elected president of the Society of Leather Trades Chemists at the annual meeting held in Leeds University on 19 and 20 September. He succeeds DR. LIONEL GOLDMAN (E. and J. Richardson, Newcastle-upon-Tyne), who was presented with a silver cigarette box, by PROFESSOR DONALD BURTON (Professor of Leather Industries, Leeds) to mark his period as president.

● MR. W. H. AWTY, who has retired as senior buyer in the supply department of Winnington works of ICI, has been presented by his colleagues with an electric fire.

● MR. N. R. GOODBODY and MR. P. E. GREVILLE, directors of Albright and Wilson, Dun Laoghaire, Co. Dublin, are visiting Canada. They sailed from Liverpool for Montreal, in the 'Empress of Britain,' on 26 September.

● The Swiss Government has awarded the national Ruzicka Prize for Chemistry for 1958 to DR. ALBERT ESCHENMOSER, of Balgach, St. Gall, for his researches in connection with turpenoid polyenes.

● MR. RICHARD TURNER has been appointed a managing director of Johnson, Matthey and Co. Ltd., as from 1 October. He relinquishes his position of managing director of Mallory Metallurgical Products Ltd., a subsidiary company, but remains a director.

● MR. R. E. HUFFAM, a director of Unilever, has been elected president of the British Standards Institution. MR. GEOFFREY CUNLIFFE, of the British Aluminium group, succeeds Mr. Huffam as chairman of the BSI finance committee.

● DR. C. COCKRAM and DR. J. W. WOOLCOCK, two directors of ICI Heavy Organic Chemicals Division, Billingham-on-Tees, have this last month completed 30 years with ICI. Dr. Cockram, production director, was olefine works manager at Wilton for seven years before he became production director of the new division in January this year. He joined Brunner Mond as research chemist in 1928 from the Safety in Mines Research Board. Dr. Woolcock, who was petrochemicals manager in Billingham Division technical department before becoming technical director of the HOC Division, started at Billingham in 1928 and a year later became secretary of a special group in research department.

● As stated in People in the News last week, SIR ALEXANDER FLECK, K.B.E., F.R.S., D.Sc., has been appointed chairman of the Scientific Advisory Council to the Minister of Power in succession to SIR GEORGE THOMSON, F.R.S. Other members of the council are LIEUT.-COLONEL S. J. M. AULD, SIR LAWRENCE BRAGG, SIR JOSIAH ECCLES, CAPT. W. GREGSON, SIR HENRY JONES, SIR HARRY MELVILLE, MR. LEONARD ROTHERHAM, DR. B. F. J. SCHONLAND, MR. K. T. SPENCER, MR. A. H. A. WYNN.

● DR. DAVID JOHN MANNERS, B.A., Ph.D., Meldola Medallist for 1957, will give the Meldola Medal lecture at the Royal Institution, 21 Albemarle Street, London W1, on Monday, 17 November, at 5.45 p.m. His subject will be 'Recent advances in the structural analysis of polysaccharides'. In the chair will be PROFESSOR W. WARDLAW, president of the Royal Institute of Chemistry.

● DR. RICHARD WECK, Director of the British Welding Research Association, has accepted an invitation from the American Society for Metals to lecture to its Seminar on Residual Stresses on 30 and 31 October and 1 November at Cleveland, Ohio, during the 40th national congress of the society.

● MR. G. S. COPE has been appointed general manager of Freeman, Taylor Machines Ltd., specialists in stainless steel fabrications, Necton Street Works, Syston, Leicestershire.

● MR. T. DUNCAN, a director and sales manager of Vitamins Ltd., is retiring shortly.

● MR. STUART DOUGLAS, deputy director of the British Man-Made Fibres Federation is one of the UK members of the 15-strong European mission visiting the US under the auspices of the Organisation for European Economic Co-operation. Members of the mission are officials of European trade associations scheduled to spend five weeks in the US discussing activities with trade organisations there with particular reference to services provided for members.

● DR. F. S. GORRILL, M.D., M.R.C.P., F.R.C.S., B.Sc., deputy managing director of Evans Medical Supplies Ltd., Speke, Liverpool, is spending six weeks in the US, and is due back on 23 October.

● DR. A. A. EDDY, M.A., D.PHIL., who has been appointed professor of industrial biochemistry at Manchester College of Science and Technology, is 32 years of age. He joined the Brewing Industry Research Foundation in 1953 and was appointed to the senior staff of the college in 1956 in charge of the Department of Microbiology.

● MR. WILLIAM HERBERT SHARLAND, a director of Powell Duffryn Ltd., has been appointed deputy chairman. MR. RAYMOND COURTNEY SALOWAY has been appointed a director of the company.

● MR. J. S. M. DASHWOOD has been appointed a director of Miles Laboratories Ltd. He will act as director of production at the company's factories in Bridgend, Glamorgan.

● MR. J. G. BEDFORD, manager of the chemical factory of Ciba Laboratories Ltd., at Pyewipe, Grimsby, has joined the board. He has been with the Ciba organisation for 12 years and has been responsible for the development of the Pyewipe factory since its inception. The factory makes sulphonamides and other fine chemicals for conversion into finished pharmaceuticals in the factory at Horsham and bulk export to Ciba overseas companies. Further extensions to the factory are now in progress.

● Board of the new US ICI-Celanese Corporation company (see p. 553) which initially will be known as Lindum Fibres Corporation, will comprise: MR. J. H. BLACK, president, DR. R. T. ARMSTRONG, MR. J. W. BROOKS and MR. G. H. RICHARDS from Celanese Corporation: MR. E. A. BINGEN, DR. A. CARESS, DR. E. D. KAMM and MR. C. I. RUTHERFORD, from ICI. Dr. Caress is chairman of ICI's Fibres Division; Dr. Kamm and Mr. Rutherford, directors of this division. Mr. Bingen is an ICI director and is responsible for ICI's interests in the Western hemisphere and Africa.

● MR. G. V. BRIDGES has resigned as managing director, Willows Francis Ltd., due to ill health. He remains on the board as consulting director. The new managing director is MR. T. F. C. SHAILER, formerly of May and Baker.

Obituary

MR. F. A. SPENCE-BROWN, one of the four joint managing directors of Johnson, Matthey and Co. Ltd., Hatton Garden, London EC1, died on Monday. He was 61, and joined the firm as an office boy 46 years ago. The death of his colleague on the joint managing directors' committee, Mr. E. G. Pickering, was recorded last week.

TRADE NOTES

Brit. Celanese Market Forticel

British Celanese plastics division is marketing in the UK as agents for Amcel Co., New York, US, Forticel, a new plastics moulding powder. Described as cellulose propionate, Forticel is used principally in the form of moulding powders, which are said to be particularly suitable for radio cabinets, telephone housings, pens, etc. The preparation is stated to be easy to mould and fabricate, and is available in a wide range of formulations and colours.

Minnesota's Stain Repellant

A new chemical treatment for fabrics, which is claimed to provide a complete barrier against oil and water based staining agents, as well as dry dirt, e.g. soil or soot, has been developed by Minnesota Mining and Manufacturing Co. Ltd., 3M House, Wigmore Street, London W1. It is known as Scotchgard, and is a fluoro chemical preparation. Fabrics treated at the manufacturing stage are stated to be sealed against absorption by oil, water and carbon-based dry dirt. No reproofing is claimed to be required if dry-cleaning is used. The new preparation also operates on footwear.

Glaxo's Influenza Vaccine

Glaxo Laboratories Ltd. have introduced a new influenza vaccine, Invirin, to provide protection against virus influenza, including the Asian type. The vaccine contains three strains of influenza virus vaccine: the Asian type; an epidemic strain influenza virus 'type A' from the Netherlands; and 'B type' strain, isolated in the UK. Only one injection of the vaccine is required.

New Courtauld Fabric

Duracour, a spun-dyed viscose, is a new fabric introduced by Courtaulds Ltd. It has a special resinous backing with a new face finish, is fire resistant and liquid repellant as well as being dirt and stain resistant. Ability of the fabric to 'breathe' makes it suitable for upholstery coverings.

Pangborn Blast Cleaning Plant

A leaflet describing the various types of Pangborn shot blasting and dust control equipment now available from Hepburn Conveyor Co. Ltd., Rosa Works, Wakefield, can be obtained from the company which holds sole manufacturing rights in the UK from the Panborn Corporation, Hagerstown, Maryland, US.

Superfine Molybdenum Disulphide

By means of a quasi air flotation method, Moly-Paul (K. S. Paul (Molybdenum Disulphide) Ltd., Great Western Trading Estate, Park Royal Road, London NW10, have now produced, on a commercial basis, a molybdenum disulphide powder of average particle size of ¼ micron to ½ micron. Trial production batches are stated to have shown considerable consistency of results. The particle size distribution of this new Moly-Paul superfine powder has a distribution of over 65 per cent under ¼ micron particle size. The flake-like structure of the molybdenum disulphide has been maintained. No change in *p*H value has been detectable, when the material is compared with standard and micronated particle size materials.

Until full production commences, experimental samples only will be available to interested parties.

Midland Silicone to Move

The London head offices of Midland Silicones Ltd. are moving to new and larger premises at 68 Knightsbridge, SW1 (Knightsbridge 7801) on Monday, 13 October. The move has been dictated by the steadily increasing volume of business now being handled by the company, a member of the Albright and Wilson Group and a UK associate of the American Dow Corning Corporation.

Head office departments involved in the move include home and export sales. The South-Eastern area sales office is also to move. Sales accounts will continue to be handled from the Midland Silicones plant at Barry, South Wales.

Changes of Name

Borax (Argentina) Ltd., 18 Austin Friars, London EC2, have changed their name to Boroquimica Ltd.

Tobal Products Ltd., manufacturers of chemical, pharmaceutical and biological products, 8 Baker Street, London W1, have changed their name to Tobal Laboratories Ltd.

New Lab-Pencil

The new Lab-pencil, available from Glen Creston Ltd., 41 Church Road, Stanmore, Middx, is said to be suitable for writing on all surfaces. The writing is waterproof. Price, per box of 12 is 14s.

Russians Negotiate Treforest Deal

FOLLOWING the visit of a three-man Russian delegation to the works of the Treforest Chemical Co. Ltd., near Pontypridd, a return visit of a group of the company's technicians to Russia is being arranged in anticipation of 'very substantial' deal being completed.

The proposal is that Treforest Chemicals should export photographic gelatine to USSR and import muriate of potash. Both transactions would be on a cash basis; there is no suggestion of barter. The Treforest company uses muriate of potash in the production of chlorine and caustic potash.

Mr. L. Leiner, chairman of the company, says that negotiations with the Russians were started 12 months ago and when the trade delegation arrived in this country recently representatives accepted an invitation to visit the Treforest plant. They appeared to be most impressed and took away samples of gelatin.

DIARY DATES

MONDAY 6 OCTOBER

SCI—London: 14 Belgrave Square, S.W.1, 6.30 p.m. 'Some developments in the field of chemical propellents', by W. S. Wood.

TUESDAY 7 OCTOBER

RIC—Rochester: Sir Joseph Williamson's Mathematical School, High Street, 7.30 p.m. Forum 'Careers in chemistry'.

Soc. for Visiting Scientists—London: 5 Old Burlington Street, W.1, 7.30 p.m. Discussion 'Metric system in Great Britain'.

WEDNESDAY 8 OCTOBER

Association of British Chemical Manufacturers—London: Grosvenor House, Park Lane, W.1, 7 p.m. Annual dinner.

Plastics Inst.—Cardiff: Grand Hotel, Cardiff, 6.30 p.m. 'Works Study', by L. G. Humble (ICI).

SAC—Coventry: Technical College, The Butts, 7 p.m. Discussion on 'Determination of trace impurities in metals', opened by R. Bagshawe and W. T. Elwell.

THURSDAY 9 OCTOBER

RIC—Brighton: Technical College, 6.30 p.m. 'An introduction to colour photography', by A. Marshall.

SAC—London: 'The Feathers', Tudor Street, E.C.4, 6.30 p.m. Discussion on 'Strategy in the assessment of disinfectants', opened by G. Sykes.

SCI—Derby: College of Art, 7.30 p.m. 'Recent developments in inorganic stereochemistry', by Prof. R. S. Nyholm.

FRIDAY 10 OCTOBER

OCCA—Manchester: Blackfriars House, Parsonage, 6.30 p.m. 'Some observations on characteristics and properties of alkyd resin media', by Dr. F. G. Dunkley.

SCI with CS & RIC—Aberdeen: Marischal College, 7.30 p.m. 'Enzyme systems in polysaccharide degradation', by Prof. I. A. Preece.

UK Chemical Prices Lower Than a Year Ago

WHOLESALE prices in the chemical and allied industries (home and export sales) in August stood at 2.2 lower than in August last year, according to the Board of Trade monthly index. August figure for all sales was 104.3 compared with 104.1 in July (both provisional) and 106.5 in August 1957. Index for home sales only was 104.9 in August compared with 105.0 in July (both provisional) and 106.8 in August last year.

Wholesale price index figures for chemicals in August (1954 = 100) were:

	Aug. 1958	July 1958	Aug. 1957
Commodities Produced in the U.K.			
Dyes and dyestuffs ...	110.4	110.4	111.0
Disinfectants	112.9	112.9	112.4
Fertilisers†	113.3	113.1	114.2
Insecticides, weedkillers and fungicides	92.9	92.9	99.9
Synthetic resins and plastics materials ...	94.5*	94.5*	94.5
General chemicals ...	107.2*	107.2*	108.9
Benzole, pure, BSS 136-50	106.9	106.9	106.9
Caustic soda liquor 100°TW	116.3	116.3	116.3
Soda ash, light (delivered)	115.3	115.3	115.3
Soda ash, light, f.o.r. works	117.7	117.7	117.7
Sulphuric acid, BOV ...	102.2	102.2	114.4
Sulphuric acid, ROV, 94-95 per cent ...	99.4	99.4	111.2
Drugs and pharmaceuticals	97.5*	97.6	99.1
Synthetic detergents ...	103.1	103.1	102.6
Ethyl alcohol, industrial, BSS 507-33	146.2	146.2	164.4
Commodities Wholly or Partly Imported			
Pyrites c.i.f. UK ports ...	75.1	78.2	94.9
Sulphur, crude (for acid making), c.i.f.	80.0	80.0	102.5

* Provisional † Subsidies not accounted for.

Amperometric Titration Apparatus

Details of ICI Metals Division's amperometric titration apparatus, which were reported as appearing in the September issue of *The Analyst*, have not yet been published in that journal. They will appear in a forthcoming issue.

Commercial News

- **APV Half-Year Results Show Improvement**
- **ICI Group Income £5·8 m. Below Last Year**
- **Bayer 1958 Turnover will be up by 8%**
- **Montecatini to Float £16 million Loan**

APV Co.

Trading results of the APV Co. Ltd. and home subsidiary for the half-year ended 30 June 1958 are stated in an interim report by Mr. W. E. Jenkins, chairman, to be better than for the same period in the previous year. Prospects for the current six months are considered less favourable, however, owing to a smaller volume of orders and reduced profit margins.

Interim reports from overseas subsidiaries with the exception of Canada and US, are regarded as satisfactory under prevailing trading conditions. In Canada the situation is reported as continuing to be unsatisfactory and the company is currently faced with further losses from this subsidiary.

No interim dividend is declared on the ordinary shares. Dividends on the preference shares for the six months ending 31 October will be paid 1 November. No dividends were paid on ordinary for either 1957 or 1956.

British Industrial Plastics

Acceptances have been received under provisional letters of allotment in respect of 2,155,857 shares of British Industrial Plastics Ltd., in connection with the issue of 2¼ million ordinary 2s shares at 4s 6d per share. This leaves 94,143 shares available to meet applications for additional shares.

Thomas Hedley

Profits of Thomas Hedley and Co. Ltd. for the year ended 30 June 1958 are £2,838,000. Profit after taxation is £1,524,000. The company report a successful year with profits at an all-time record, mainly attributable, it is stated, to a substantial increase in turnover, combined with more efficient operations throughout the whole organisation.

The value of exports for the year amount to some £2 million. About £800,000 was spent on research activities and some £100,000 on capital equipment for research.

ICI

Imperial Chemical Industries Ltd. have declared an interim dividend of 2¾ per cent (less income tax at standard rate for 1958/59) in respect of 1958 on the ordinary shares. This interim is equivalent to the interim of 4 per cent for 1957, after allowing for the recent scrip issue of one new ordinary share for each £2 ordinary stock held. The 1957 final was 8 per cent, equivalent to 5¼ per cent on the increased capital.

Unaudited figures show that group sales to external customers in the first half of 1958 were £232 million—£4 million higher than for the second half of 1957, but a fall of £3 million from the figure for the corresponding 1957 period. Group income, before tax, but after substantially heavier depreciation charges, amounted to £24.40 million, compared with £30.24 million for the corresponding 1957 period and with £24.89 million for the last half of that year.

After tax and minority interests, the balance applicable to the company is £12.43 million, which is an increase over the £11.92 million of the previous six months, but is lower by nearly £2.5 million compared with the first half of 1957.

It is reported that more new plants have been brought to the production stage, requiring an increase in the provisions for depreciation. These provisions have been increased by approximately £1.2 million for the first half of 1957 as a consequence of the revaluation of physical assets.

Trading conditions in the first half of 1958 were more difficult than in recent years. There has been little change in the total turnover of the products manufactured by the group despite the commissioning of new plants. The decrease in group income before taxation as compared with the first half of 1957 is principally due to the operation of some plants at lower outputs and to increases in wages and salary rates and in fuel and transport charges, without corresponding increases in selling prices.

Monsanto Chemicals

Resolutions passed last week alter the articles of Monsanto Chemicals with regard to an increase in borrowing powers of the company (see CHEMICAL AGE, 30 August, p. 367).

Shell-Royal Dutch

Unchanged interim dividends of 5 per cent, tax free, and 7½ per cent, respectively, are announced for 'Shell' Transport and Trading Co., and the Royal Dutch Petroleum Co. for 1958. In both cases the payments are on capital increased by rights issues. Final dividends for 1957, payable on the increased capitals, were 13¾ per cent, tax free, by 'Shell' and 17½ per cent by Royal Dutch.

Triplex Holdings Ltd.

When the sale of Quickfit and Quartz by Triplex Holdings Ltd. to James A. Jobling and Co. Ltd., took place, part of the sale price was in cash and part shares of Thomas Tilling Ltd. Triplex in fact obtained a holding of 144,000 Thomas Tilling £1 ordinary shares on a 50s a share basis, Thomas Tilling being the parent company of Jobling.

In his annual report, Sir Graham Cunningham, chairman of Triplex Holdings, stated that unless and until the company needed more ready money, its holding of Thomas Tilling shares would not be sold. The result of the transaction had been that taking the Tilling shares there was a net capital gain to Triplex Holdings of about £425,000 over book price.

Towler Brothers

Metal Industries Ltd., have acquired the whole of the share capital of the privately-owned Towler Brothers (Patents) Ltd. and its wholly-owned subsidiary, Electraulic Presses Ltd. The purchase price is £800,000, payable in cash. With a modern factory at Rodley, near Leeds, employing 300 people, Towlers are one of the leading manufacturers of hydraulic pumps and hydraulic control systems.

There is no intention of making any substantial changes in the operations of the company; Mr. F. H. Towler, managing director, and the other directors will continue to be responsible for running the business.

United Glass Bottle

An improvement in profits in the first half of 1958, over the first half of 1957 is reported by United Glass Bottle Manufacturers. The level of costs has remained steady, while savings have continued from factory modernisation. Outlook for the rest of the year is stated to be encouraging.

Ciba of Italy

The Italian subsidiary company of the Basle Ciba group, the Ciba-Industria Chimica, of Milan, reports for 1957 a net profit of 82.6 million lire (£50,000 approximately) as against only 54.9 million lire (£32,000 approximately) in the previous year. A dividend of five per cent (8 per cent) is being paid on the increased share capital of 1,500 million lire (700 million lire) (£88,000 approximately compared with £410,000 approximately).

Rhône-Poulenc

The directors of Rhône-Poulenc, the French chemical and pharmaceutical concern, plan to increase the company's capital from F. Frs. 12,630 million (£10.73 million) to F. Frs. 18,945 million (£16.1 million).

Farbenfabriken Bayer

The increase in annual turnover of Farbenfabriken Bayer, AG, Leverkusen, will in 1958 be one of only 8 per cent on 1957 figures, Bayer's chairman of directors, Prof. Dr. Haberland, announced last week. The increase of 1957 figures over those for the previous year had been 16 per cent. The estimated turnover for 1958 was DM 2,000 million (about £167 million), compared with DM 1,850 million

(about £155 million) in 1957. It was intended to introduce a 40-hour week at Leverkusen, although no extra labour force would be needed.

A report is to be issued in October on investment plans for the coming year.

Midec

The new industrial development organisation for the Middle East in which 120 European and six US firms are participating has been registered, with offices in Luxembourg, Beirut and the Hague, as 'Middle East Industrial Development Projects Corporation Societe Anonyme (Midec)'. Capital totals Swiss fr.2 million (about £163,000). UK firms associated with Midec include Imperial Chemical Industries and Dunlop Rubber. US members include the Koppers Co., Pittsburgh.

Montecatini

Montecatini of Milan are to call a meeting of shareholders to lay before them a plan to float a 20-year 6 per cent loan of lire 30,000 million (about £16.7 million) with which to carry out an extension of the chemicals production programme. This expansion will be particularly concerned with the building up of plastics and synthetic fibre production and research in those fields. It is stated that due mainly to lower selling prices of a number of key commodities (including sulphuric acid, nitrogen fertilisers and explosives) in Italy, there had been a fall so far this year in the company's turnover of 4 per cent on 1957 figures for a comparable period.

Phillips Petroleum

Capital expenditures estimate of Phillips Petroleum Co., US., has been revised to a new figure of around $130 million. This is reported by the president, Mr. P. Endacott. The company's original programme for this year called for $150 million, but by mid year revisions reduced this figure to about $135 million.

Potash Syndicate

Series A bonds for £478,420 nominal, Series B for £253,370 nominal and Series C for £268,210 nominal of the Potash Syndicate of Germany 25-year sinking Fund Gold Loan have been drawn for repayment—at £173 11s 5.15d per £100 nominal—out of the extra amortisation account on November 1 next.

NEW COMPANIES

SIR JOHN GALLWEY (INSTRUMENTS) LTD. Capital £100. Vendors, manufacturers, designers and proprietors of meters and other instruments for measuring moisture in hydroscopic materials, etc. Reg. office: 356/68, Evelyn Street, London, SE8.

HELLMANN CHEMICALS LTD. Cap. £10,000. To act as agents in the purchase, sale or disposal of any patent or invention or secret process whether British or foreign, or any interest therein. Power is taken to carry on business in relation to the development and application of plastics of all kinds, and as dealers in insulating, non-conducting and sound deadening materials, de-watering, air-conditioning and sterilising appliances, etc. Directors: Eugen W. Vollmer, Theodorus G. M. de Kok, Jacobus J. T. de Kok, Henning C. F. Behrendt, Erik Ran, Gordon D. Brewater. Secretary, H. C. F. Behrendt. Reg. office: 123a Kings Road, London, SW3.

LABORATORY SUPPLY CO. (BARROW-IN-FURNESS) LTD. Cap. £1,000. Manufacturers and dealers in laboratory apparatus. Directors: Alexander W. McLaren and William Horner. Reg. office: Ramsden Dock, Barrow-in-Furness.

JOSEPH LEVY AND CO. LTD. Cap. £1,000. Manufacturers of and dealers in chemicals, gases, drugs, etc. Director: J. Levy. Reg. office: 712 Romford Road, London E12.

MAGNALOY PRODUCTS LTD. Cap. £5,000. To manufacture, distribute and sell devices for the neutralisation of acids and other toxic and destructive products in internal combustion engines, etc. Directors: J. R. Johnston, C. Trethewey. Reg. office: 37 Windsor Street, Chertsey, Surrey.

SPRAYLAT LTD. Cap. £1,000. Manufacturers of and dealers in chemicals, particularly import and export chemicals, chemical compounds, compounds, cements, oils, paints, resins, coating materials, etc. Directors: G. E. Borner, P. L. Mahoney, R. D. Oppenheim, R. W. Wreford and J. L. Horncastle. Reg. office, 2/627 Duncan Terrace, N1.

WESTFALIA SEPARATOR (GREAT BRITAIN) LTD. Cap. £10,000. Manufacturers of and dealers in high speed and other separators. Directors: Robert Altman, 56 Kings Court, Wembley Park, Middx, director of Altman and Besser Ltd.; Hugo Habig and Josef G. Kaminski, both of Germany. Reg. office: 2 Clements Inn, London WC2.

INCREASES OF CAPITAL

BERK EXOTHERMICS LTD., Berk House, Portman Square, London W1. Increased by £25,000 beyond the registered capital of £25,000.

HICKSON AND WELCH (HOLDINGS) LTD., Ings Lane, Castleford, Yorks. Increased by £450,000 beyond the registered capital of £950,000.

Market Reports

Home Trade Satisfactory

LONDON There has been no outstanding feature on the industrial chemicals market during the past week and for the most part new buying interest has not extended beyond covering immediate needs. Nevertheless, the movement on home account against contracts continues to be satisfactory. A steady flow of overseas inquiry has been in circulation with actual bookings on a moderate scale.

The demand for the coal-tar products has been quietly active with the xylols in good call.

MANCHESTER Traders on the Manchester chemical market this week state that there is considerable room for improvement in the consumption of bleaching, dyeing and other textile chemicals, especially in the cotton and allied trades. Contract deliveries to most other industrial outlets are on a fair scale, however, although generally speaking replacement buying does not extend so far ahead as it did a few months ago. Prices continue on a steady basis. There is a fair demand in several sections of the fertiliser trade, with a quietly steady movement reported in the leading tar products.

GLASGOW From a trading point the past week has not provided much alteration on the Scottish market. Industrial demands generally have been steady with no appreciable increase in quantities. These have been for the usual range of acids, alkalis, caustics, etc. Prices, on the whole, have remained steady.

Agricultural chemicals remain seasonably quiet.

Petrochemicals Ethylene Oxide Plant on Stream Soon

MR. F. J. ERROLL, Parliamentary Secretary, Board of Trade, who visited Petrochemicals Ltd., an associate of the Shell Chemical Co., at Partington, on 26 September, was welcomed by Mr. L. H. Williams, managing director, and other members of the Petrochemicals board.

The visitors saw the results of the extensive work which has been carried out on the Partington site during the last three years and visited some of the new plants and particularly the large unit for the manufacture of ethylene oxide from ethylene by direct oxidation which will be commissioned in the next few weeks.

The party also visited the new engineering workshops and other recently installed utilities and saw work in progress on the new research laboratories which are expected to be completed this year.

Floating Laboratory for Research in BWA

LAUNCHED at Brightlingsea, Essex, last week was a 60-ft. diesel-engined river boat which is to be fitted up as a travelling laboratory for the British Research Council's unit at Gambia, BWA.

Christened the m.v. Lady Dale, after the wife of Sir Henry Dale, O.M., F.R.S., chairman of the Wellcome Trust which granted the funds, the vessel is costing £26,000. She will carry a native crew of four, and accommodates four research workers.

Basic equipment already installed includes a still and deep freeze, and the final fitting out will be under the direction of Dr. I. A. McGregor, a specialist in the bacteriology of tropical diseases, who leads the Gambia team.

NEW PATENTS

By permission of the Controller, HM Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sale Branch), 25 Southampton Buildings, Chancery Lane, London WC2, price 3s 3d including postage; annual subscription £8 2s.

Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

ACCEPTANCES

Open to public inspection 5 November

Compounds of uranium and their utilisation in energy-producing devices. Hollins, C., and Appleton, E. V. **804 062**

Method for the production of uranium. Imperial Chemical Industries, Ltd., Cooke, W. H., and Crawford, J. W. C. **804 063 & 804 064**

Production and working of refractory metals. Imperial Chemical Industries, Ltd., Cooke, W. H., and Crawford, J. W. C. **804 065**

Sublimation process and apparatus. Krohn, R., and Schmidt, R. J. **803 989**

Anodic treatment of uranium metal. UK Atomic Energy Authority. **803 990**

Rubber compositions. Dunlop Rubber Co., Ltd. **803 993**

Washers for sealing joints in pipes conveying aromatic hydrocarbons. Pneumatiques et Caoutchouc Manufacture Kleber-Colombes. **803 997**

Dehydrogenation of alcohols. Knapsack-Griesheim, AG. **804 132**

Purification of polyethylene. Ruhrchemie, AG. **804 072**

Corrosion resistant austenitic steel. Hadfields, Ltd. [Addition to 741 053.] **803 816**

Bicyclononanols and ethers thereof and a composition of matter with a woody amber-like scent, and process of making same. Firmenich, A., Firmenich, R., Firmenich, G., and Firmenich, R. (trading as Firmenich & Co.). **804 051**

Stable dispersions of oxides of metals and/or metalloids. Deutsche Gold- und Silber-Scheideanstalt Vorm. Roessler. **804 140**

Lubricant for the surface of an insulated wire. General Electric Co. **804 112**

Continuous bleaching of textile fabrics made from vegetable fibres. Imperial Chemical Industries, Ltd. **803 796**

Production of amines. Imperial Chemical Industries, Ltd. [Addition to 712 100.] **804 113**

Process for the refinement of fatty acid esters. Noblee & Thoerl, G.m.b.H. **804 022**

Sulphonamidophosphoric esters. Olin Mathieson Chemical Corp. **804 052**

Anion-exchange resins. Permutit Co., Ltd. **804 066**

Lactic acid derivatives and process for the preparation thereof. Boehringer, A., Boehringer, E., Liebrecht, I., Liebrecht, J., and List, W. Mayer- (trading as Boehringer Sohn, C. H.). **804 117**

Treatment of anion-exchange resins. National Research Development Corp. **804 074**

Production of cross-linked elastomers. Farbenfabriken Bayer AG. **804 067**

Preparation of an elastic polyurethane composition. Lemförder Metallwarengesellschaft. **804 025**

Polysiloxanes. Rohm & Haas Co. **804 119**

Semiconductor comprising silicon and method of making it. Standard Telephones & Cables, Ltd. **803 830**

Preventing corrosion in the cooling system of an internal-combustion engine. Farbenfabriken Bayer, AG. **803 832**

Granular fertilisers. Scottish Agricultural Industries, Ltd., and Imperial Chemical Industries, Ltd. **804 053**

Alkyl phenols. Institut Francais Du Petrole, Des Carburants et Lubrifiants. **804 121**

Esters of cyclic amino-alcohols. Lakeside Laboratories, Inc. **804 123**

Method for the treatment of hair and di-thiocarbamate derivatives therefor. Van Ameringen-Haebler, Inc. [Addition to 771 627.] **804 077**

Production of hydrocarbon polymers. Monsanto Chemical Co. **804 079**

Filaments of high density, high molecular weight ethylene polymers and method of making such filaments. Dow Chemical Co. **804 054**

Thiochromones and thioxanthones. Farbenfabriken Bayer AG. **803 803**

Vinyl-phosphoric acid ester. Farbenfabriken Bayer AG. **804 080**

Preparation of urea-formaldehyde moulding powders. Soc. Belge de L'Azote et Des Produits Chimiques du Marly. **804 055**

Substance having antioxidant activity and its preparation from yeast. Pennsylvania, Trustees of the University of. **803 898**

Production of organosilicon compounds. Midland Silicones, Ltd. **804 097**

Derivatives of 4-hydroxycoumarin and their production. Farbenfabriken Bayer AG. **804 125**

Working up low pressure polyolefines. Chemische Werke Hüls AG. **804 081**

Esters and vinyl chloride polymer compositions containing same. Monsanto Chemical Co. **804 057**

Glass compositions. Pittsburgh Plate Glass Co. **804 106, 803 927 & 803 928**

Process for preparing fluorosilanes. Grace & Co., W. R. **804 068**

Improving the transparency of polyolefines. Chemische Werke Hüls AG. **804 058**

Preparation of aromatic nitriles and imides. Distillers Co., Ltd. **803 901**

Germicides. Monsanto Chemicals, Ltd. **804 047**

Copolymers of vinyl acetate and fumarate. Esso Research & Engineering Co. **804 029**

Aqueous colloidal dispersions. Dow Chemical Co. **804 030**

Drying apparatus. American Cyanamid Co. **803 904**

Flameless combustion of organic substances. Helberger, J. H. **803 929**

Polymeric compounds and products containing same. Du Pont de Nemours & Co., E. I. **804 069**

Removal of metal contaminants from polymers. Esso Research & Engineering Co. **804 082**

Production of alkyl alkoxy aluminium halides, alkyl aryloxy aluminium halides, and alkyl aluminium dihalides. Badische Anilin- & Soda-Fabrik AG. **804 059**

Polymerisable silane derivatives and method for producing same. Union Carbide Corp. **803 961**

Copolymerisation of diolefines and alpha-olefines. Chemische Werke Hüls AG. **804 083**

Therapeutic compositions. Warner-Lambert Pharmaceutical Co. [Addition to 771 768 and 793 379.] **804 084**

Lubricating oil containing polypropylene. Esso Research & Engineering Co. **804 085**

Phthalocyanine pigments. General Aniline & Film Corp. **804 031**

Dyeing textile materials with dyestuff emulsions. Badische Anilin- & Soda-Fabrik AG. **804 032**

Manufacture of regenerated cellulose sponge material. General Mills, Inc. **804 126**

Derivatives of leucauramine. National Cash Register Co. **804 087**

Preparation of cyclohexenone derivatives. Soc. Des Usines Chimiques Rhone-Poulenc. **804 089**

Joining glass articles and composition therefor. Corning Glass Works. **803 963**

Electrolytic production of iron powder. Soc. D'Electro-Chimie, D'Electro-Metallurgie et Des Acieries Electriques D'Ugine. **803 844**

Production of unsaturated hydrocarbons. Chemische Werke Hüls AG. [Addition to 792 604.] **804 090**

Production of aluminium powder. Norddeutsche Affinerie. **803 908**

Disazo pigments and their use. Geigy AG., J. R. **803 985**

Manufacture of a sulphanilamide of the isoxazole series. Hoffmann-La Roche & Co. AG, F. **804 036**

Organopolysiloxane resin. General Electric Co. **803 845**

Copper-containing trisazo dyestuffs. Farbenfabriken Bayer AG. **803 810**

Cyclosiloxanes. Midland Silicones, Ltd. **804 098**

Niobium alloys. Du Pont De Nemours & Co., E.I. **803 855 & 803 937**

Cellulosic product. Kimberly-Clark. **803 987**

Recovery of pure dimethyl terephthalate. Badische Anilin- & Soda-Fabrik AG. **803 849**

Dimerisation of polypropylenes. Esso Research & Engineering Co. **804 070**

Open to public inspection 12 November

Uranium hexachloride and processes of producing same. Jenkins, F. A. **804 311**

Waterproofing compositions and use thereof. Tretol, Ltd. **804 241**

Method of and apparatus for preparing or improving the stability of suspensions or emulsions. Torrance & Sons, Ltd. [Cognate application 33802.] **804 317**

Production of refractory carbides, borides and the like. British Aluminium Co., Ltd. **804 242**

Separating naphthalene from hydrocarbon oils by azeotropic distillation. A.P.V. Co., Ltd. [Cognate application 33453.] **804 221**

Fluid mixing devices. Walker Crosweller & Co., Ltd. **804 350**

Adhesive compositions. Dunlop Rubber Co., Ltd. **804 201, 804 202 & 804 203**

Expanded thermoplastic materials. Dunlop Rubber Co., Ltd. **804 244**

Lubricating compositions containing copolymers of unsaturated amides and unsaturated esters. Esso Research & Engineering Co. **804 222**

Production of integralgas. Woodall-Duckham Construction Co., Ltd. [Cognate application 29887.] **804 432**

Apparatus for the treatment of granulated substances. Companie Industrielle de Procedes et D'Applications, S. A. **804 365**

Means for skimming oil and like floating liquids from bodies of water, such as the sea. Waren, F. A. O. [Cognate applications 11424 and 32062.] **804 368**

Siloxane-oxyalkylene block copolymers. Union Carbide Corp. **804 369**

N-β-[cyclohexyl (or hexahydrobenzyl)-aryl (or aralkyl)-amino]-ethylpiperidines and process for their preparation. Farmaceutici Italia, S. A. **804 321**

Organopoly-siloxane impregnating agents for textiles. Wacker-Chemie G.m.b.H. **804 162**

Metal-coated fibres. Owens-Corning Fibreglas Corp. **804 301**

Sulphonation process. Continental Oil Co. **804 346**

Preparation of alkaryl sulphonic acids. Continental Oil Co. **804 347**

Coating compositions. Continental Oil Co. **804 348**

Alkaryl sulphonates. Continental Oil Co. **804 349**

Infra-red reflecting protective coatings. Eltro G.m.b.H. & Co., Ges. Für Strahlungstechnik. **804 157**

Coating compositions comprising gelatin, particularly for photography. Kodak, Ltd. **804 283**

Filters, and water purification plants employing filters. Sudan Gezira Board. **804 163**

Production of hydrocarbon polymers. Phillips Petroleum Co. **804 175**

Process for preparing membranes selectively permeable to cation. Asahi Garasu Kabushiki Kaisha. **804 176**

Process for the production of alcohols. Ziegler, K. **804 335**

Discharging and conveying of granular materials. Imperial Chemical Industries, Ltd. **804 164**

Phosphorus-containing esters containing sulphone groups and a process for their production. Farbenfabriken Bayer AG. **804 141**

Production of aqueous dispersions of vinylidene chloride copolymers and of moistureproof sheet wrapping materials produced therefrom. British Cellophane, Ltd. **804 285**

Quinuclidines and process for their manufacture. Ciba Ltd. **804 204**

Resinous coatings and coating compositions. Du Pont de Nemours & Co., E. I. **804 178**

Method of and apparatus for flame spraying pulverulent or paste-like thermoplastic materials. Baldus, R. [trading as Munk & Schmitz Komm.-Ges.] **804 179**

Treating polymers of olefins and di-olefins. Bataafsche Petroleum Maatschappij N.V., De. [Cognate application 31273.] **804 304**

Detection of hydrogen cyanide or vinyl cyanide. Mine Safety Appliances Co. **804 355**

Purification of sewage and other waste liquor. Whitehead & Poole, Ltd., and Kessener, H. J. N. H. **804 249**

Coated thermoplastic polymeric films. Du Pont de Nemours & Co., E. I. **804 286**

Aromatic dicarboxylic acids, derivatives thereof and synthetic linear polymers. British Nylon Spinners, Ltd. **804 225**

Vulcanisation accelerator. Goodyear Tire & Rubber Co. **804 183**

Classified Advertisements

CLASSIFIED RATES: All sections 5d. per word. Minimum 8/-. Three or more insertions 4d. per word. Box Number 2/- extra. Up to 10 a.m. Tuesday for insertion same week.
SEMI-DISPLAY: 30/- per inch. Three or more insertions 25/- per inch.
SUBSCRIPTION: Annual Subscription of 52/6 brings 52 weekly copies of CHEMICAL AGE direct to your address from the printer (postage paid by the publishers), and a copy of CHEMICAL AGE DIRECTORY AND WHO'S WHO.
COMPANY MEETINGS AND REPORTS: £12.12.0 per column. Three column measure (approximately 360 words).

EDUCATIONAL

A.M.I.CHEM.E.—More than one-third of the successful candidates since 1944 have been trained by T.I.G.B. All seeking quick promotion in the Chemical and Allied Industries should send for the T.I.G.B. Prospectus. 100 pages of expert advice, details of Guaranteed Home Study Courses for A.M.I.Chem.E., B.Sc.Eng., A.M.I.Mech.E., A.M.I.Prod.E., C. & G., etc., and a wide range of Diploma Courses in most branches of Engineering. Send for your copy today—**FREE.** T.I.G.B. (Dept. 84), 29 Wright's Lane, London, W.8.

OFFICIAL APPOINTMENTS

EXPERIMENTAL OFFICERS AND ASSISTANT EXPERIMENTAL OFFICERS in Government Departments. Pensionable posts for men and women: Mathematics, Physics, Meteorology, Chemistry, Metallurgy, Engineering subjects, Miscellaneous (e.g. Geology, Ecology, Library and Technical Information Services). Experimental Officers: age 26 and normally under 31 on 31.12.58; Assistant Experimental Officers 18 and normally under 28 on that date. Extension for service in Forces and Overseas Civil Service. Qualifications should normally include H.S.C. or G.C.E., or equivalent, or H.N.C. or University degree. Provisional admission if taking those examinations in 1958. Experimental Officer: Salary scale (Men) within £920-£1,190; Assistant Experimental Officer: Starting salary from £370 up to £685. Men's maximum (London) £850. Promotion prospects. Further education facilities. Write **Civil Service Commission, 30, Old Burlington Street, London, W.1.**, for application forms quoting No. S94-95/58.

SITUATIONS VACANT

CHEMICAL BUYER.—Large merchant company require junior buyer for purchasing department London. Knowledge of chemical sources of supply and export an advantage but not essential. Reply giving details of education, experience and present salary to Box 3629.

RESEARCH CHEMISTS.—Sondes Place Research Institute, Dorking, Surrey, has vacancies for an **ORGANIC CHEMIST** and a **PHYSICAL CHEMIST.** Starting salaries in the range £750-£900 per annum according to qualifications and experience. Permanent positions; five-day week; pension scheme. Write for application form.

FOR SALE

NEW 24" AIRSCREW BLOWERS
4" delivery, 3/4 H.P. Motor, 230/250 Volts, 3 Phase, 50 cycles. £22-0-0 Each.
THOMPSON & SON (MILLWALL) LIMITED, LONDON E.14. Tel: East 1844.

FOR SALE: continued

MORTON, SON AND WARD LIMITED
offer
HYDRO EXTRACTORS:
TWO 60 in. by **BROADBENT,** little used, complete with Igranic starters.
36 in. by **BROADBENT,** belt driven. Could be motorised.
42 in. by **WATSON LAIDLAW,** under driven through Vee ropes.

NEW UNITS in stainless or mild steel made to requirements.
CONDENSERS,
MIXING VESSELS, JACKETED PANS with or without mixing gear.
'MORWARD' 'U' shaped trough **MIXERS** with or without jackets.
TANKS: CYLINDERS: RECEIVERS: PRESSURE VESSELS and **AUTOCLAVES.**
TWO 600g open top and **TWO** 400g totally enclosed jacketed pans.
One 700g **VERTICAL DIGESTER.**
Stirring gear can be fitted to any vessels.
New portable **STIRRING UNITS** with clamp-on attachment to requirements.
New **MONO** Pumps and other second-hand pumps in stock.
AIR COMPRESSORS: motorised, from 5 to 60 c.f.m. with or without receivers.
RECEIVERS supplied to requirements.
Enquiries invited:
MORTON, SON AND WARD LIMITED,
WALK MILL,
DOBCROSS, OLDHAM,
Lancs.
Phone Saddleworth 437

Miracle Mill with 35 H.P. A.C. S/R Motor.
Portable Aluminium Tanks 6 ft. 6 in. by 3 ft. 6 in. by 3 ft. 6 in.
Copper Jacketed Revolving Coating Pan 6 ft. diam.
Hobart 80 Qrt. 4-speed Electric Mixer.
100 gall. M/S Vertical Encl. Mixing Vessel.
200 gall. Cherry Burell Stainless Coil Vat.
Good selection of 'Z' Blade Mixers up to 100 gallons capacity.
At our No. 2 Depot, Willow Tree Works, Swallowfield, Berks.
Apply: **Winkworth Machinery Ltd.,** 65 High Street, Staines, Middlesex. Telephone: 1010.

DEGREASING AND CLEANING DOWN—One man can do the work of five with B. & A. steam-cleaning-with-detergent equipment; ready for use from your own steam supply. "Speedylectric" high-efficiency steam lance; 30 ft. steam hose; 15 ft. detergent hose; £44 complete. Ideal for the Chemical industry. Leaflet L.126 **HYZONE LTD.,** 2 Rosslyn Crescent, Harrow, Middlesex.

***BOX NUMBERS:** Reply c/o "Chemical Age" • Bouverie House • Fleet Street EC4.*